State of Rhode Island Education Adequacy Study

INITIAL REPORT FOR REVIEW & COMMENT BY THE COMMITTEE

presented by

R. C. Wood & Associates

to the

Joint Committee to Establish a Permanent Education Foundation Aid Formula for Rhode Island

March 2, 2007

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Executive Summary

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In April of 2006 the firm of R. C. Wood & Associates replied to a national request for proposals as presented by the state of Rhode Island. The firm was selected after review by the Joint Committee on Legislative Services. The firm made numerous visits to the state and conducted numerous in depth analyses to determine the adequacy of the funding for elementary and secondary schools in the state.

For this research project the research team consisted of Dr. Craig Wood, University of Florida, Mr. Steve Smith, Education Finance, Law, and Policy Consultant, Denver Colorado, Dr. Bruce D. Baker, University of Kansas, Dr. Bruce Cooper, Fordham University, Dr. Ronald DiOrio, University of Rhode Island, Dr. Charles H. McLaughlin, Jr., Rhode Island College, and Dr. Robert Shaw, Brown University.

The firm conducted four research methodologies in order to determine what fiscal adequacy ranges that the state of Rhode Island should consider in order to provide every child in the state with an adequate opportunity to meet high educational standards.

Additionally, the firm offered an overall professional opinion that the state of Rhode Island should move from an appropriation model of distributing funds to school districts to a student need based driven model. The education finance distribution aid formula should have base student allocation conceptually founded on one of the research methodologies or some combination thereof.

The education finance distribution formula should reflect an adequate amount for the base student funding as well as reflect vertical equity adjustments for student needs as evidenced by weights and the cost of delivering educational services in the state. The student need weights were identified by the research team as:

- Students in Poverty,
- Students in English Language Programs, and
- Students in Special Educational Programs.

In order to identify the adequacy target expenditure, four education finance models were conducted. The four models were:

- Successful Schools Model
- Advanced Statistical/Cost Function Model
- Professional Judgment Model
- Evidenced Based Model

The Successful Schools Model is essentially the process of examining the expenditures of schools that are deemed "successful" as measured by state assessments. With adjustments created via discount rates that account for various school demographics, a model can be determined that yields a targeted expenditure equal to what successful schools are achieving in the state of Rhode Island. Depending upon the discount rate applied, the increase expenditures required to reach targeted adequacy levels range from $ 56.7 to $ 128.3 Million.

The Education Costs/Production Function Model was conducted. This model essentially creates a regression equation consisting of a host of variables to create a curve of best fit. Cost of education variables such as poverty, language proficiency, and disabilities as well as competitive wages and issues of scale were addressed. Based on the cost function model the research team estimated the targeted increase to be $ 42.4 Million.

The Professional Judgment Model was conducted with a statewide survey of every building principal and numerous focus group meetings with "expert educators" to estimate the adequacy levels for various prototype schools. Nine different prototype schools were created, reflecting small, medium, and large, elementary, middle, and high schools. Organizational and scale variables ranged from an increase of 1.8 percent to a high of 31.8 percent. Overall, this model produced an estimate of an additional $ 153.5 Million. Additionally, the expert panels determined that "Insufficient Progress" students would require an additional $ 51.3 Million for extended educational opportunities for a total of $ 204.8 Million of increased funding to meet adequacy targets.

The Evidenced Based Model is essentially built on the concept of identifying the costs of educational strategies and concepts that appear to be the most successful in improving student performance. Numerous examples of recently identified effective strategies that have met strict evaluation procedure were. The research team also was concerned that the bulk of these strategies are virtually impossible to cost out and to determine if they might be generalizable to the state of Rhode Island. Nonetheless, the professional opinion of the research team was that certain programs, e.g., full day kindergarten could be implemented and that other pilot programs should be undertaken by the state along with the creation of a state of the art program evaluation system. The total costs associated with model were $53.35 Million.

Additionally, the report contains a number of views on education finance aspects unique to Rhode Island conducted by notable Rhode Island educators. These viewpoints yield additional insights and thoughts for consideration beyond the four research methodologies presented.

Thus, in final summary the four models and the target expenditures they generate were as follows:

- Evidenced Based Model $53.35 Million
- Professional Judgment Model $204.8 Million
- Production/Cost Production Model $42.4 Million.
- Successful schools Model. $56.7 to $128.3 Million.

Finally, as a means of helping Rhode Island move these results into action, a paper on key elements for an adequate funding formula is provided.

Education Costs, Cost Variations, and Efforts to Determine Adequate Funding

It has long been established that state education finance distribution formulas should be designed to accommodate differences in educational need by allocating different levels of financial resources across schools and districts.[1] Weighted student formulas date back nearly as far, with examples of weighted pupil calculations to adjust for grade level and school size provided in textbooks dating back to at least 1951.[2] At that time, primary emphasis was on the different costs of providing quality education under different geographic circumstances. Education finance scholars were evaluating the relative costs of providing curricular opportunities in high schools of varied size. Scholars and policymakers were beginning to realize that there were sets of conditions that were outside of the control of local school districts that affected the costs of operating schools.

Since the Coleman report in 1966, much greater emphasis has been placed on the influence of family backgrounds, on student outcomes, and the related costs of offsetting educational deficits associated with socio-economic status of the family. Empirical research on costs, student needs and educational outcomes has been reflected for many years in the education finance literature.

The goal of state finance aid distributional formulas is to provide students, regardless of their individual backgrounds or their geographic circumstance, with comparable opportunity to achieve educational opportunities. Since the emergence of the 1990s accountability movement and subsequent passage of the federal No Child Left Behind Act of 2001, the emphasis of many state school finance policies have been on outcomes and providing equitable opportunity to achieve them. This emphasis is enhanced by various types of cost adjustments.

Student need driven state education finance driven formulas are rooted in the assumption that financial leverage can be applied to offset deficits that some children bring to the table by virtue of birth circumstances. Further, financial leverage can be used to create equitable conditions for learning, and ultimately more equitable student opportunities in otherwise very different environments, from the urban core to remote, sparse rural schools hours from the nearest population center. Ultimately, the education finance distribution formula must strive toward the right balance of student and societal needs.

Factors affecting the "cost of education"

The following illustration provides an overview of factors influencing education costs. Ideally, a need-adjusted budget allocation formula, like a weighted student formula, accounts for those factors that affect costs, and are outside of control of local school districts. The preponderance within education finance research regarding costs identifies

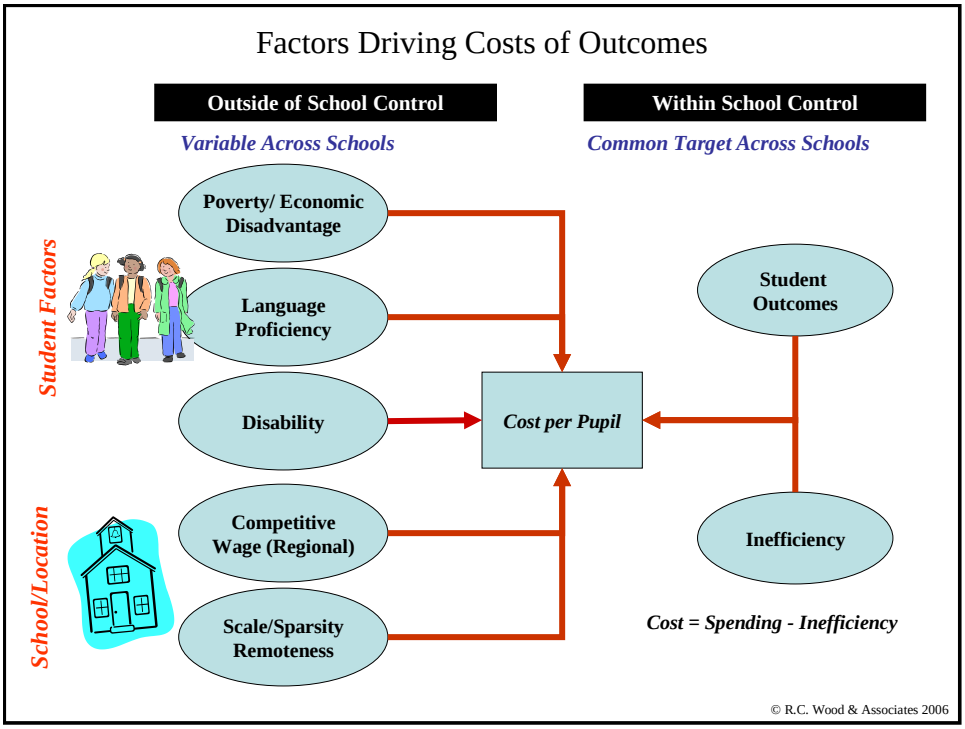
[1] Mort, P. (1924). *The Measurement of Educational Need.* New York: Bureau of Publications, Teachers College, Columbia Univ.

[2] Mort, P. & Reusser, W. (1951). *Public School Finance*. New York: McGraw-Hill, p. 75.

two sets of factors: (a) school or district structural and location related factors; and (b) student population characteristics. Factors within school or district control include the actual student outcomes produced and the efficiency with which those outcomes are produced.

Using the following illustration, one can imagine that the goal of a student need driven formula might be to identify that level of resources (cost per pupil at the center of the picture) that would be needed, given the student characteristics and school characteristics, to achieve a given level of student outcomes, if the school produced outcomes at an average (or better) level of efficiency. That is, one would not want to give a school more funding simply because they are inefficient producers. Likewise, policymakers should exercise extreme caution in allocating additional resources on the direct basis of low student outcomes.

Policymakers also have to be careful not to omit major cost factors as shown on the left-hand side of the illustration that are outside of local school control. When those factors are ignored or under-compensated, it will be perceived that the school is inefficient, even when the inefficiency is outside of the control of local school officials. For example, small school size leads to inefficiency. It costs more to achieve the same outcome in a smaller school, especially when elementary school size drops below 100 pupils. That said, there may be those cases where an elementary school of fifty students needs to exist, by virtue of geographic isolation, in which case, the state necessarily absorbs the inefficiency (or closes the school and relocates all of the residents to a more populated location, an unlikely alternative).



Student Need Factors

In education policy research in general, and in cost analysis in particular, two types of measures are used to capture differences in student population characteristics and related needs – ***Sociological Proxies*** and ***Individual Educational Needs***. A relatively straightforward contrast can be made between marginal costs based on school or district poverty rates and marginal costs based on counts of limited English proficient students.

Education cost studies, in particular cost function models, include measures of the share of children in poverty in a school district not as a measure of the individual educational programming needs of any one or a group of students in the district, but as a broad proxy measure of the socio-economic conditions in the school district, which most often relate quite strongly with educational outcome differences. Clearly, not each child identified as living in poverty or qualifying for subsidized lunch will require specific, measurable supplemental educational programs or services. Rather, it can be shown that additional financial leverage, perhaps played out in reduced class sizes or improved teacher quality, can have positive marginal effects on the outcomes of populations disproportionately from impoverished family backgrounds. By contrast, counts of children with limited English language skills relate more directly to the need for additional tutoring and language instruction involving specialized teachers in contact with specific students.

Because poverty measures within education finance policies are not intended to identify individual students needs, but rather to predict the likelihood that children requiring additional learning support exist in certain schools, there is greater flexibility in how one approaches poverty measurement at the school or district level. Nonetheless, no method is best for all circumstances. Free lunch counts are based on children living in families at 130 percent the U.S. Census Bureau poverty rate, and are annually adjusted but not regionally sensitive. At this higher threshold, one would certainly expect subsidized lunch counts to be much higher than counts of children in families qualifying at the poverty level.

Nationally, using subsidized lunch rates from school year 2000 and U.S Census Poverty rates, poverty rates explain about 85 percentage of variance in subsidized lunch rates, and on average, a 1 percentage difference in Census Poverty rate is associated with a 2 percent difference in subsidized lunch rate. Variance in this relationship from one state to the next depends on the numbers of families in each state that lie in the income range between the poverty level itself, and 130 percent of that poverty level.

Ultimately, when selecting a proxy for vertical equity adjustment, one would like to find the proxy that predicts well educational outcome deficiencies but is not manipulable by school or district officials, and does not create perverse incentives. Clearly, funding on the basis of poor performance directly would create such incentives. The alternative is to discern which poverty or other socio-economic proxy best predicts outcome deficiencies across districts.

School Structural & Location Factors

Beyond individual student needs, a variety of organizational, structural and geographic factors influence the cost of providing comparable services across schools and districts. Such factors include, but are not limited to:

> *Geographic variations in the prices of educational inputs*: Input prices are influenced by markets. If we take the market price for comparable teachers for example we find that it differs from one district to the next and from one state to the next. Presumably, district hiring and the uniform salary schedule they offer would tend to equalize teacher quality within the district. However, high ability teachers can be quite sensitive to local variations in working conditions and this inevitably adversely affects less environmentally desirable schools in their efforts to recruit talented teachers.
>
> *Scale of school or district:* Scale (size) is most often defined in terms of numbers of pupils and is most often addressed at the district level. Scale may be addressed in terms of either the scale at which productivity is maximized, at which cost is minimized, or where greatest efficiency is achieved. Scale (over sparsity or remoteness) most significantly affects annual operating costs at the school or district level because scale strongly influences the organization of staffing to deliver core services. The choice to accommodate scale inefficiencies through state policy may be contingent upon remoteness but the adjustment itself should be based on scale.
>
> *Sparsity of student population:* Sparsity is typically defined in terms of the number of pupils in residence per square mile. Sparsity most specifically drives costs associated with transportation, and not the core instructional budgets of schools, unless distance education alternatives are provided due to sparsity.
>
> *Grade level (& Range):* Some state aid distribution formulas account for differences in "costs" associated with providing educational services at different grade levels. Most such studies report higher costs at the secondary level.[3]

Geographic Variations in Wages

Geographic variations in the prices paid by school districts for educational resources are a function of both discretionary (demand side) and cost (supply side) factors. Discretionary factors are those factors within the control of local school districts. Cost factors are those

[3] Gronberg, T., Jansen, D., Taylor, L., Booker, K (2004) *School Outcomes and Schools Costs: The Cost Function Approach*. College Station, TX: Busch School of Gov, Texas A&M Univ.

factors that are outside of the control of local school districts, e.g., the availability of qualified science teachers, local market prices for utilities or for materials, supplies and equipment. The goal in establishing a geographic cost of education index is to identify specifically those cost differences outside of control of local administrators, or, for example, the different costs of a teacher given the same levels of education and experience.

Historically, three basic approaches have been used to address differences in competitive wages for teachers across schools or districts or broader regions within states. The three basic approaches to adjustments include (a) cost of living adjustments, (b) comparable wage adjustments and (c) hedonic wage model adjustments.

Cost of living adjustments are intended to compensate teachers and other school employees across school districts or regions within a state for differences in costs of maintaining *comparable* quality of living. Cost of living adjustments typically assume some basket of basic goods and services required for attaining a specific quality of living. Goods and services of a specific quality level are identified, and the price differences for purchasing those goods or services are estimated across regions in a state. The basket of goods typically includes things such as housing, food, clothing, childcare and healthcare.

Without careful design and construction a problem could emerge in utilizing cost of living adjustments for adjusting school aid. It is often the case that wealthy, generally more advantaged schools or districts in and around more desirable locations will show higher costs of the basket of goods and services. Using an index based on such findings results in supporting very different rather than similar quality of life across teachers within a state.

Competitive (Comparable) wage adjustments are estimated for teachers by evaluating the competitive wages of workers in other industries requiring similar education levels and professional skills as teachers. To the extent that competitive wages for similar work (at similar levels of experience, education, age, etc.) varies across regions or school districts within a state, so too, it is assumed, that competitive wages for teachers must vary. The underlying assumption is that teacher's wages must be competitive with other local industries requiring comparable skills, or teachers might choose to work in those industries instead of education. Because local labor markets vary, competitive teacher wages must vary.

Unfortunately, little is known about the mobility of teachers into other supposedly comparable or competitive professions and vice versa, and less is known about the potential role of wages in influencing mobility into and out of the teaching profession from other professions.

Hedonic wage adjustments focus specifically on teachers' employment choices within the field of education and attempt most directly to provide each school

district with comparable opportunity to recruit and retain teachers of similar quality. A vast body of educational research indicates that teachers' job choices are driven primarily by location and work conditions including but not limited to student population characteristics. Neither cost of living indices nor competitive wage indices addresses work conditions of teachers. Among those work conditions that are typically considered outside of the control of local school districts are student population characteristics, crime and safety issues and to some extent facilities quality and age. A well estimated hedonic wage index should capture the negative effects of difficult work conditions on teacher choices, resulting in higher index values for the cost of recruiting a teacher of comparable quality into more difficult working conditions, assuming all else equal.

Shortcomings of the hedonic approach most often relate to the availability of sufficient, detailed data to capture expected patterns of competitive wage variation in relation to teacher quality. Presently, teacher wages vary both within and across school districts primarily as a function of years of service and degree level, due to the deeply embedded single salary schedule.

Instead of district level indices, comparable wage or cost of living indices might be applied to the consolidated metropolitan statistical area (CMSA), or core based statistical area (CBSA) covering a wide array of districts of varied need, but neither compensating for, nor against those needs. The downside of this approach is that districts in economically depressed regions of a state will likely be assigned lower competitive wage or cost of living indices, making it difficult to ever recruit in new, higher quality teachers from other regions of the state. In effect, the index will reinforce the depressed state of the local economy.

Ideally, a well estimated hedonic wage index would capture at least some of the additional costs associated with bringing similar quality teachers into more difficult settings. Unfortunately, data issues pertaining to the measurement of teacher quality typically mute if not negate entirely this desired *combat pay* effect. Whether a wage index fully accounts for teacher quality influences how that wage index should be integrated with other cost adjustments, like additional funding for at risk children.

The underlying premise of providing additional funding to school districts serving greater proportions of at risk children is that these children will need more contact with teachers of comparable quality if the legislature were to expect them to achieve the same outcomes as other children. That is, they need a higher quantity of teachers of similar quality. If the wage index compensates the cost of recruiting teachers of similar quality into schools with more at risk children, then the at-risk adjustment need only compensate for the costs associated with the higher quantity of teachers needed. However, where the wage index does not fully capture additional costs associated with comparable quality, the at-risk adjustment must compensate for both quality and quantity.

Where a metropolitan area comparable wage or cost of living index is used, with no differential for difficult work conditions across school districts within the metro area, larger weightings will be needed for at risk children in the general aid formula. Student driven weights will have to compensate for required differences in both teacher quantity and competitive wages. If a well-estimated hedonic wage index were to capture the competitive wage difference associated with disadvantaged student populations, separate weights for at risk children might be smaller because they need only compensate for teacher quantity differences.

The following Table summarizes the three approaches, the application, strengths, and shortcomings. First and foremost it is important to differentiate between the goals of the methods. The overall state policy goal is to attempt to implement a cost of education index, as a legitimate vertical equity and adequacy adjustment, regardless of its limitations. In this manner, the state legislature, over time, can develop, refine, and more carefully analyze the exact impact of the concept on public education in the state of Rhode Island.

Alternative Approaches to Wage Modeling

Approach	Goal	Data	Geographic Unit	Strengths	Shortcomings
Cost of Living	Uncontrollable costs to employees of living in commutable distance	Basket of local goods/ services	Labor market (CBSA/ CMSA)	Not (less) influenced by current teacher compensation	Most often supports higher quality of living for teachers in "advantaged" districts
Competitive Wage	Wage required to keep a person with specific education/ knowledge/ skills in teaching within a specific labor market	Wages of comparable professions	Labor market (CBSA/ CMSA)	Not (less) influenced by current teacher compensation Based on competitive labor market assumptions	Teachers don't typically move to "comparable" professions Influenced by inequities across local/ regional economies
Hedonic Wage	Wage required for recruiting and retaining teacher of specific quality attributes	Wages of teachers by background attributes & conditions	School or district	Only approach to consider localized work conditions	Strongly influenced by the current single salary schedule

Scale, Sparsity & Remoteness

The concept that costs per pupil vary by district size, sparsity, and location is well accepted in education finance. But, why do cost differences exist by school district size, or more precisely, what role does "size" or enrollment alone play in dictating district costs per pupil? It is important to distinguish, for example between costs related to the scale of operation, and costs related to the location and geography of operation. When it

comes to the annual operation of schools, factors that affect personnel costs tend to be the most significant factors influencing total costs. Less significant to annual operating budgets (though certainly not unimportant) are costs associated with food, transportation, and other facilities operations. The majority of annual operating expenditures of public school districts are allocated to salaries and wages of school and district personnel. K-12 education is a personnel intensive service industry. The personnel cost equation is essentially:

Price x Quantity = Cost

Where *Price* refers to the competitive wage that must be offered in a school district to attract teachers and/or administrators and other staff with specific qualities. Equality of educational opportunity requires that price or wage reflects the price of recruiting teachers of specific qualities, and that sufficient resources exist such that each district has the ability to attract sufficient quantities of teachers with those qualities. Quantity simply indicates the quantity of teachers and other staff required to provide the appropriate educational programs/services.

District geographic factors may affect either the price or the quantity or both of school personnel.

Costs related to district or school size (enrollment): School size primarily affects teacher quantity requirements. Small districts unable to consolidate due to geographic isolation must operate inefficiently small classes simply to provide sufficient curricular opportunities, in terms of both depth and breadth.

Costs related to sparsity: School district sparsity most directly affects transportation costs. The further apart and further the linear distances from schools that students live, the greater the costs of transporting those students to schools, where those costs are driven by depreciation, driver hours, fuel costs, vehicle numbers and vehicle maintenance. However, once those students have arrived at school, cost effects of sparsity are limited. Sparsity *may* affect annual operating costs of districts in two other ways. A district may be so sparse, or spread out that additional schools are required for very small numbers of students. In this case, the costs of sparsity are related to the costs of operating low-enrollment schools, where necessary. Where the school is the unit of analysis, this concern is negated. Finally, sparsity of a school district may affect teacher travel, either for specialized teachers splitting time between distant facilities, or simply for recruitment of high quality teachers to distant locations. These costs associated with sparsity may be more directly associated with remoteness.

Costs related to remoteness: Costs associated with remoteness overlap significantly with costs associated with sparsity. The primary cost-effects

of remoteness likely result from prices of recruiting quality teachers and other school staff. Remoteness also likely affects the prices of other goods and services (food delivery, materials and supplies, equipment, maintenance & repair contracts etc.). However, these costs are a much smaller share than core personnel costs of total annual operating costs.

The concept and/or measurement of economies of scale in education may be viewed from either of two perspectives: (1) what is the school or district size at which students are able to achieve maximum output for a given level of input? Or (2) what is the school or district size at which a given level of output can be achieved at minimum cost? That is, economies of scale may be analyzed via the education production function, or via the education cost function. Production is typically analyzed at the school or classroom level, where it is assumed that most teaching and learning occur. Cost, on the other hand, is typically measured at the district level, because districts are the organizational units that raise revenues, receive intergovernmental transfers, and internally allocate resources. Research findings remain mixed on both production and cost fronts.

While the production perspective is important, the cost perspective on economies of scale is of primary interest in school finance policy. This is because the measurement of cost differences across districts of varied size has direct implications for the design of state school funding formulas. For example, if it is found to cost 25 percent more than average to provide comparable education services in a district with only 300 pupils, then the state may choose to allocate an additional 25 percent aid per pupil. State legislatures should be cognizant, however, of the anti-consolidation incentive created by such policies.

Cost function research suggests consolidation of very small rural districts may save money, as long as districts are kept at a moderate size, and transportation times remain reasonable. Increasing district size beyond a certain level of students in a sparsely populated area will probably not save significant money.

Methods for Measuring Education Costs via Adequacy Studies

We discuss briefly the alternative methods used for estimating education costs in studies of "educational adequacy." We draw heavily on the recent work of Taylor, Baker and Vedlitz who organize cost studies into studies of average expenditures, studies of required resources and statistical models of education production and cost.[4]

Average expenditure studies (Successful Schools)

Prior to the 1990s, estimates of education costs and base funding levels in state aid formulas were often guided by the average or median expenditures of school districts in

[4] Taylor, L., Baker, B., and Vedlitz, A., (2005). Measuring Educational Adequacy in Public Schools. Working Paper. Bush School of Govt. Texas A&M Univ.

the prior year. A common assumption was that median spending was adequate, and that states should strive to bring the lower half of districts up to the median.

With increased prevalence of state standards and assessments, consultants and policymakers in the early 1990s turned their attention to the average expenditures of school districts meeting a prescribed set of outcome standards, rather than the simple average or median of all districts. This approach was coined the Successful Schools Model.

Successful schools studies use outcome data on measures such as attendance and dropout rates and student test scores to identify that set of schools or school districts in a state that meet a chosen standard of success. Then, the average of the expenditures of those schools or school districts was considered adequate (on the assumption that some schools in the state are able to be successful with that level of funding). Modified successful schools analyses include some consideration of how schools use the resources. This is done in either of two ways. In most cases, analysts may use data on how schools use the resources to identify and exclude peculiar, or outlier schools or districts from the successful schools sample. Alternatively, one might seek patterns in resource allocation to identify those schools that allocate resources in such a way as to produce particularly high outcomes, with particularly low expenditures.

Resource Cost Studies (Professional Judgment and Evidence Based)

The *Resource Cost Model* (RCM) is a method that has been used for measuring the costs of educational services.[5] In general, RCM is a method for measuring costs of services, existing or hypothetical, adequate or not. The RCM methodology typically involves three steps: (1) identifying and/or measuring the resources (people, space, materials and time) used in providing a particular set of services; (2) estimating resource prices, and price variations from school to school or school district-to-school district; and (3) tabulating total costs of service delivery by totaling the resource quantities (resource intensity) and the prices.

In recent years professional judgment and evidence-based methodologies have emerged from the RCM model. The difference between them lies in the strategy for identifying the resources required to provide an adequate education. In professional judgment studies, focus groups of educators and policymakers are convened to prescribe the "basket of educational goods and services" required for providing an adequate education. In evidence-based studies, resource needs for staffing and staff development are derived from "proven effective" Comprehensive School Reform (CSR) and other models that purport to focus on improving educational outcomes in high poverty schools. More

[5] Chambers, J.G. (1999). Measuring Resources in Education: From Accounting to the Resource Cost Model Approach. Working Paper # 1999-16, Washington, DC: National Center for Education Statistics, OERI, U.S. Dept. of Educ. W. Hartman, Bolton., D. and Monk, D.H. (2001). A Synthesis of Two Approaches to School-Level Financial Data: The Accounting and Resource Cost Model Approaches. In W. Fowler (Ed.) *Selected Papers in School Finance, 2000-01*, Washington, DC: NCES, OERI, U.S. Dept. of Educ.

recent evidence-based analyses have attempted to integrate a variety of "proven effective" input strategies such as class size reduction, specific interventions for special student populations and comprehensive school reform models, rather than relying on a single reform model.

One might assume, for example, that a panel of well informed professionals would prescribe inputs for schools based at least partly on the professionals' knowledge of research literature on effective reform strategies. The subtle distinction between this and *evidence-based* analysis is that evidence-based analysis requires a specific empirical research basis for recommended resource configurations. Evidence-based models do not, however, require rigorous meta-analysis of all available studies on each possible intervention. Nor does application of evidence-based cost analysis require that the interventions in question be evaluated with respect to specific, policy relevant outcome measures. Thus, various studies purport to be evidenced based and yet use various standards of what and how studies are chosen for this standard.

Unfortunately, a major shortcoming of either professional judgment or evidence base is that these studies appear to poor estimators of the actual costs of educating children. Professional judgment models suffer from significant reliability and validity issues while evidence-based models often draw assumptions based on studies with very limited or no generalizability.

Statistical Modeling Studies (Education Cost Function)

Increasingly common among recent analyses of educational adequacy are statistical methods that may be used either to estimate (a) the quantities and qualities of educational resources associated with higher or improved educational outcomes or (b) the costs associated with achieving a specific set of outcomes, in different school districts, serving different student populations. The first of these methods is known as the education production function and the second of these methods is known as the education cost function. The two are highly interconnected and—like successful schools analysis—require policymakers to establish explicit, measurable outcome goals.

Education production function analysis can be used to determine which quantities and qualities of educational resources are most strongly, positively associated with a designated set of student outcomes. For example, is it better for a school to have more teachers or fewer teachers with stronger academic preparation at the same total cost to maximize some desired outcome? Further, education production function analysis can be used to determine whether different resource quantities and qualities are more or less effective in districts serving different types of students (economically disadvantaged, English language learners), or in different types of districts (large urban, small remote rural).

Cost function analyses, similar to production function analyses, utilizes statistical models. In cost function analysis, the goal is to estimate the cost of achieving a desired set of educational outcomes and further to estimate how those costs differ in districts with certain characteristics, serving students with certain characteristics. For example,

achieving state average outcomes in a high poverty urban district may have quite different costs than achieving the same outcomes in an affluent suburb. A cost function that has been estimated with existing data on school district spending levels and outcomes, and including data on district and student characteristics, can be used for predicting the average cost of achieving a desired level of outcomes in a district of average characteristics serving a student population of average characteristics. Further, the cost function can be used to generate a cost index for each school district that indicates the relative cost of producing the desired outcomes in each school district. For example, it would likely be found that per pupil costs of achieving target outcomes are higher than average in small, rural school districts, that costs are higher in school districts with high percentages of economically disadvantaged and limited English proficient children, and that costs are higher where competitive wages for teachers are higher.

The cost function is an extension of the production function where the goal is to estimate directly, in a single model, the costs of achieving desired outcomes, while with a production function, the goal is to identify those inputs that produce desirable outcomes, and subsequently estimate the cost of those inputs. To date, outcome measures used in cost function studies have been narrowly specified, including primarily measures of student achievement in core subject areas.

Reconciling the Various Approaches

In a perfect world, with perfect information regarding the relationship between resource mix and student outcomes (for guiding bottom-up analysis), perfect data on student outcomes and perfect measures of district inefficiency (for guiding top-down analysis), resource cost and statistical cost function analysis would produce the same results. All distortions in cost estimates would be eliminated in each type of analysis. Resulting distortions of resource oriented versus performance-oriented analyses may be quite similar or quite different.

Ideally, education finance researchers utilizing resource cost approaches for calculating the cost of adequacy would have perfect information regarding the lowest cost mix of resources that would lead to the desired educational outcomes for a given set of students under a given set of conditions. As stated, resource mix is most often arrived at not by estimating the relationship between resource mix and existing student outcomes, but either by the recommendations of professional judgment panels or by identifying specific educational reform models believed by researchers to be effective. To date, evidence on the effectiveness or the cost-effectiveness of professional judgment models and evidence based models that commonly guide such analyses remains questionable at best.[6] Not to

[6] Levin, H. (2002). *The Cost Effectiveness of Whole School Reforms*: *Urban Diversity Series No. 114.* New York, NY: ERIC Clearinghouse on Urban Educ., Inst. for Urban and Minority Educ. Borman, G. and Hewes, G. (2002). The Long-Term Effects and Cost Effectiveness of Success for All. *Educational Evaluation and Policy Analysis, 24*, 243–266. Borman G., Hewes, G., Overman, L., and Brown, S. (2003). Comprehensive School Reform and Achievement: A Meta-Analysis. *Review of Educ. Research, 73*, 125-230. Bifulco, R., Bordeaux, C., Duncombe, W., and Yinger, J. (2002). *Do Whole School Reform Programs Boost Student Performance? The Case of New York City*. New York, NY: Smith-Richardson Foundation.

mention, these reforms are most often introduced within the context of available resources, rather than empirically estimated resource needs, and with existing teachers.

When the prescribed resource mix is not the most efficient mix that could be purchased at a given total cost, resource cost analyses will lead to distortions in cost indices and these distortions may have differential effects across districts of varied size or of varied student populations. It is safe to assume that most cost indices produced by resource cost analyses include at least some such distortion.

Similar problems exist in the estimation of statistical models of costs. Statistical models of costs rely on existing school district expenditure data, and relationships between expenditure data and current levels of student outcomes. Attempts are made to subtract inefficiencies from expenditure data. That is, it is possible that a district with a specific set of characteristics currently spends more than necessary to achieve its current level of outcomes. Further, it is possible that common patterns of inefficiency exist across all, or similar sets of districts in a state. Where some or all of these inefficiencies go unmeasured, actual costs (assuming either average, or maximum efficiency) of outcomes may be overstated for some or all districts.

Summary and Synthesis of Cost Study Findings – Base Costs

Cost study findings may be decomposed into base costs and marginal costs:

> **Base Costs:** Base costs take a number of different forms, depending largely on estimation method used. Base costs are typically expressed as either the minimum or the average cost per pupil of achieving the state mandated outcome level. Input oriented studies identify some basic set of inputs required in a school or district assuming no students, or a minimum threshold of students with special needs. Base costs represent the costs of the core educational program inputs. In contrast, cost functions typically yield a figure that represents the cost of achieving the mandated outcome level in a district of average characteristics. That is, the cost of achieving a specific set of student outcomes, in a district of average size, labor costs and student population characteristics. If these costs were placed side by side with input oriented base costs, and if input oriented base costs truly reflected inputs needed to achieve the same outcomes, then the cost in the average district would be expected to be higher than the costs in a district assuming no additional student needs (or other additional costs).
>
> **Marginal Costs:** Marginal costs represent the additional costs associated with a variety of factors beyond control of local district officials. These factors may be divided into two groups – district related factors and student need factors. Among school district factors are (a) economies of scale and (b) regional variation in competitive wages and other input prices. Among student factors are the additional costs associated with bringing at risk, limited English proficient and learning-disabled students to desired outcomes. Marginal costs may be expressed in either dollar-value terms – how many more (than base or average) dollars per

need pupil are required to achieve the mandated outcome? – or in cost index terms – relative to base (input based) or average (cost function) costs, how much more (usually a percentage expression) is required to achieve the mandated outcome?

Marginal costs are of primary interest in this report because it is the marginal cost estimates that may be translated into empirically based student need weights.

Summary and Synthesis of Cost Study Findings – Marginal Costs

In this section, we provide an overview of findings from recent studies of education cost regarding the additional costs associated with student needs and school size. We focus only on recent studies for a number of reasons. First and foremost, with few exceptions, only recently have education cost studies attempted to estimate the cost of achieving specific educational outcomes. Older studies that purport to estimate education costs usually simply estimated what had previously been spent on certain programs. In recent years various state legislatures have utilized various weights, many of them apparently reflecting historical precedent rather than what best practice might indicate.

Weights for poverty have varied from about 10 percent above the base to more than 250 percent above the base. It is critical to note that the various approaches have been utilized and many of them similar to the previous illustration were conducted by plaintiff and advocacy groups with little credibility as to the various research protocols utilized.

Similarly for Limited English Proficient students various studies have reported a wide variety of costs.

<u>Marginal Expenditures on Children with Disabilities</u>

Questions regarding appropriate outcome measurement continue to create problems for true cost measurement in special education, especially where the most severe disabilities are involved. As such, the best recent evidence on special education "costs" consists of detailed analysis of special education spending. Recent studies have reflected numbers from 1.9 to 2.08 depending upon the severity of the special education need.

Additional expenditures merely reflect what has been spent, historically, by public schools on special education students. Additional expenditures are not costs because there is not specific quality of service, or outcome standard associated with the spending patterns (other than the average of current practice).

That said, if one assumes that the average special educational services provided across the nation are indeed adequate, then the appropriate average weight for special education services would be approximately two times the average expenditure

The following table summarizes additional costs by disability level and desegregations of costs by specialized and generalized services received. One should note that the average special education student had total expenditures of $12,474 compared to the average

regular education student at $6,556. As one might expect, expenditures rise for higher severity categories of children with disabilities and children with multiple disabilities. Again, these average expenditure patterns might serve as guidelines for a weighting system on special education funding, but these patterns merely reflect average expenditures of current services, with no measure of the adequacy of student outcomes.

Average Expenditures per pupil by Disability in 1999 – 2000
Special Education Expenditure Project (SEEP)

	TOTAL	Ratio to Average	Special Education Services	% Special Education
Average Non SE Student	$6,556			
Average SE Student	$12,525	1.90	$8,126	65%
Specific Learning Disability	$10,558	1.60	$5,507	52%
Speech/Language Impairment	$10,958	1.70	$6,334	58%
Other Health Impairment	$13,229	2.00	$8,754	66%
Emotional Disturbance	$14,147	2.20	$9,885	70%
Orthopedic Impairment	$14,993	2.30	$10,888	73%
Mental Retardation	$15,040	2.30	$11,393	76%
Hearing Impairment/Deafness	$15,992	2.40	$11,006	69%
Traumatic Brain Injury	$16,542	2.50	$12,459	75%
Autism	$18,790	2.90	$15,219	81%
Visual Impairment/Blindness	$18,811	2.90	$13,796	73%
Multiple Disabilities	$20,095	3.10	$16,098	80%
Pre-school	$13,426	2.00	$10,013	75%
Students Placed in Non-Public Schools	$25,580	3.90	$25,580	100%

Source: Adapted from Exhibit B1, Chambers, J.G., Shkolnik, J., and Perez, M. (2005). Total Expenditures for Students with Disabilities: Spending Variation by Disability. http://www.csef-air.org/publications/seep/national/Final_SEEP_Report_5.PDF.

Additional considerations in the design of a school-site allocation formula for special education services include whether the state wishes to define some portion of the special education allocation as a flat allocation across schools school districts based on a uniform expected share of children with "high incidence/low severity" disabilities. That is, a block grant or flat funding might be allocated for those children who partake primarily of general education services. Such an approach can encourage integrated services and create much greater flexibility for school officials regarding personnel use.

This increasingly popular approach – the census-based block grant – requires that there be a relatively even distribution of those children with mild to moderate disabilities across schools. On average, that share may be about 14 percent. We note that Missouri, in the phase in of its new foundation formula assumes the base cost figure of $6,117 to also cover the expected share of children with mild to moderate disabilities. This figure is based upon a successful schools model being targeted for expenditures within the state.

Resource Costs Associated with Children with Disabilities

Marginal Costs for Children with Disabilities from Input-Oriented Studies

State	Authors	Base Cost	SPED Margin (Scale Effic.)	SPED Weight	
Colorado	APA	$6,815	$9,881	1.45	
Kansas	APA	$5,811	$12,090	2.08	
Kentucky	DAV	$8,438	$8,230	0.98	
Maryland	APA	$6,612	$7,748	1.17	
Maryland	MAP	$7,461	$12,173	1.63	
Missouri	APA	$7,832	$9,625	1.23	
Montana	APA	$6,004	$7,216	1.20	
Nebraska	APA	$5,845	$9,181	1.57	
North Dakota	APA	$6,005		-	
Tennessee	APA	$6,200		-	
Connecticut	APA	$9,207	$12,337	1.34	
Nevada	APA	$7,229	$6,472	0.90	[m]
Minnesota	APA	$5,938	$5,938	1.00	
New Jersey	APA	$8,016	$3,337	0.42	[m]

[m] mild disability only (others included in study)

Data Sources: Baker, 2006

Marginal Costs of LEP/ELL and At-Risk Children

The vast majority of recent education cost studies focus on two major demographic factors as influencing the cost of educational outcomes – at-risk children, usually defined in poverty terms and limited English proficient children.

The following table summarizes the findings of numerous recent educational adequacy studies performed across states, all using "input-based" resource cost methods. Each example used a version of professional judgment analysis to prescribe a core set of educational inputs that became the "base" cost figure, and then proposed different caseloads and/or additional personnel to meet the needs of LEP/ELL children and children from impoverished families. Note that on the issue of poverty, input based studies typically rely on whatever count method is presently used in a state. In some cases, these studies provide little or no guidance to professional judgment panels as to what actually is meant by "poverty" or "at-risk." Rather, panels merely provide specifications for prototypical schools that list the percent of children in poverty and/or with limited English proficiency. Specification of the expected outcomes is also similarly "loose" in most such studies. Professional judgment panels are asked, "what would it take" to achieve state mandated outcome levels (a) with this group of children and (b) with that group of children, (c) under these circumstances and (d) under those circumstances? In some cases, members of professional judgment panels may have little or no experience with certain children under certain circumstances.

In the following table base costs are regionally and inflation adjusted to comparable 2004 values using a comparable wage index developed by Taylor.[7] After adjustment, most base costs fall in a similar range. Marginal costs are not similarly adjusted, but are converted to weights based on unadjusted base costs.

Marginal Costs for Economically Disadvantaged and LEP/ELL Children from Input-Oriented Studies

State	Authors	Base Cost	Poverty Margin (Scale Effic.)	LEP/ ELL Margin (Scale Effic.)	Poverty Weight	LEP/ELL Weight
Colorado	APA	$6,815	$2,501	$3,874	0.37	0.57
Kansas	APA	$5,811	$2,578	$5,993	0.44	1.03
Kentucky	DAV	$8,438	$817	$817	0.10	0.10
Maryland	APA	$6,612	$9,165	$6,612	1.39	1.00
Maryland	MAP	$7,461	$7,038		0.94	-
Missouri	APA	$7,832	$2,744	$4,446	0.35	0.57
Montana	APA	$6,004	$1,810		0.30	-
Nebraska	APA	$5,845	$2,436	$5,682	0.42	0.97
North Dakota	APA	$6,005	$2,192	$4,651	0.37	0.77
Tennessee	APA	$6,200	$1,262	$4,544	0.20	0.73
Connecticut	APA	$9,207	v	$6,997		0.76
Nevada	APA	$7,229	$2,558	$3,409	0.35	0.47
Minnesota	APA	$5,938	$5,344	$5,344	0.75	0.90
New Jersey	APA	$8,016	$3,752	$3,381	0.47	0.42

V=variable by concentration

Data Sources: Baker, 2006

The following table decomposes the marginal costs for LEP/ELL children from five input-based studies. These studies tend to assume caseloads of approximately twenty LEP/ELL children per specialist teacher. In some cases, additional aides are included. These studies assume that LEP/ELL specialists will be available at the average teacher salary. This may or may not be the case. It may, in fact, be quite difficult to recruit and retain sufficient numbers of multi-lingual teachers to provide adequate educational services even with the 20 to 1 proposed caseloads.

[7] http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2006321Now available through the National Center for Education Statistics, at: http://nces.ed.gov/edfin/prodsurv/data.asp. Taylor, L. L., and Glander, M. (2006). *Documentation for the NCES Comparable Wage Index Data File* (EFSC 2006-865). U.S. Department of Education. Washington, DC: National Center for Education Statistics.

Assumptions Underlying Input-Based Analyses for LEP/ELL Children

Underlying Cost Structure of Supplemental Programs for LEP/ELL

	Kansas	Colorado	Missouri	North Dakota	Nebraska
Elementary					
Students	430	400	450	322	350
ELL Students	17	44	4	3	18
Teachers	1	2	0.20	0.30	1
Salary	$ 37,183	$ 39,183	$ 40,046	$ 43,572	$ 35,695
Cost	$ 44,620	$ 94,039	$ 9,611	$ 15,686	$ 42,834
Aides	1	4	-		1
Salary	$ 16,960	$ 13,086	$ 13,433		$ 17,848
Cost	$ 20,352	$ 62,813	$ -	$ -	$ 21,418
Cost per Pupil	**$ 3,822**	**$ 3,565**	**$ 2,403**	**$ 5,229**	**$ 3,570**
Middle					
Students	430	400	506		680
ELL Students	17	44	5		34
Teachers	1	2	0.20		2
Salary	$ 37,183	$ 39,183	$ 40,046		$ 35,695
Cost	$ 44,620	$ 94,039	$ 9,611		$ 85,668
Aides	3	2	-		2
Salary	$ 16,960	$ 13,086	$ 13,433		$ 17,848
Cost	$ 61,056	$ 31,406	$ -		$ 42,835
Cost per Pupil	**$ 6,216**	**$ 2,851**	**$ 1,922**		**$ 3,780**
Secondary					
Students	1,150	800	1,348	276	1,900
ELL Students	46	88	13	3	95
Teachers	2	4	1	0.30	5
Salary	$ 37,183	$ 39,183	$ 40,046	$ 43,572	$ 35,695
Cost	$ 89,239	$ 188,078	$ 48,055	$ 15,686	$ 214,170
Aides	4	4	1		5
Salary	$ 16,960	$ 13,086	$ 13,433		$ 17,848
Cost	$ 81,408	$ 62,813	$ 16,120	$ -	$ 107,088
Cost per Pupil	**$ 3,710**	**$ 2,851**	**$ 4,937**	**$ 5,229**	**$ 3,382**

Data Sources: Baker, 2006

The following summarizes the staffing configurations proposed across twenty-three separate input-oriented studies, using variants on resource cost modeling. Core class size recommendations range from about twenty-five in Arkansas to as low as fourteen in Missouri. In theory, the rationale driving these differences is the different level of outcome desired across states. Indeed, Missouri does have a more difficult proficiency cut point to attain on its tests than Arkansas. For example, on state elementary reading assessments, 35 percent of Missouri children scored proficient or higher and on the National Assessment of Educational Progress, 33 percent of Missouri children scored proficient or higher. Missouri's assessment is relatively well aligned with NAEP. By contrast, in Arkansas, 52 percent of children scored proficient or higher on the state assessment in 2005 and only 30 percent scored proficient on NAEP.[8]

Some input-oriented studies appear to assume a caseload of around twenty or fewer for LEP/ELL children per specialist. Other researchers recommend a dramatically larger caseload, arguing that relatively small regular education class sizes and instructional coaches provided in their model should be sufficient. There is little or no evidence to validate this set of assumptions and substantial evidence statistically linking LEP/ELL status to costs and outcomes that suggests the need for much more intense services than recommended in certain states.

[8] http://www2.edtrust.org/NR/rdonlyres/15B22876-20C8-47B8-9AF4-FAB148A225AC/0/PPSCreport.pdf.

Staffing Ratios from Selected Professional Judgment Studies

State	Author	Method	Class Size				Teacher[a] Case Loads (elementary)			
			K-3	Elem	Middle	HS/Sec	LEP/ELL	Disability	At Risk	
Arkansas	Lawrence O. Picus & Assoc.	EB	15	25	25	25		33	95	[b]
Colorado	Augenblick & Colleagues	PJ		21	18	17	17	17	22	
Connecticut	Augenblick and Colleagues	PJ		17.5	21	15.5	26	15.3 v		
Hawai'i	Grant Thornton	EB		23	22	22				
Kansas	Legislative Division of Post Audit	EB	18	23	23	23				
Kansas	Legislative Division of Post Audit	EB		20	20	20				
Kansas	Legislative Division of Post Audit	EB		25	25	25				
Kansas	Augenblick & Colleagues	PJ		20	22	23	17	10	39	
Kentucky	Lawrence O. Picus & Assoc.	EB		20	20	20	16	8	100	[b]
Kentucky	Lawrence O. Picus & Assoc.	PJ	15	20	20	20				
Kentucky	Verstegen	PJ		16	21	17	6	14		
Maryland	MAP	PJ	21	21	24	25				
Maryland	Augenblick & Colleagues	PJ		15	22	17		12	10	[b],[c]
Maryland	MAP	PJ	15	15	22	22				
Minnesota	Augenblick and Colleagues	PJ		17	25	25				
Missouri	Augenblick & Colleagues	PJ		17	20	14	20	10	46	
Montana	Augenblick & Colleagues	PJ		21	25	20	-	14	25	[c]
Nebraska	Augenblick & Colleagues	PJ		18	20	19	18	13	112	
Nevada	Augenblick and Colleagues	EB		22	23	20	19		40	
Nevada	Augenblick and Colleagues	PJ		17	25	19	27	15	43	
New York	AIR/MAP	PJ		17	23	29				[d]
North Dakota	Augenblick & Colleagues	PJ		16	19	13	14	15	73	
Oregon	Oregon Qual. Educ. Comm.	PJ	20	24	29	29				
Texas	MAP	PJ	15	20	22	20				[e]
Washington	Ranier Institute	PJ	21	24	24		40	18	53	
Washington	EPIC	EB								
Wisconsin	Inst. for Wisconsin's Future	PJ	15	22	25	25				
Wyoming	Lawrence O. Picus & Assoc.	EB		16	21	21	100		100	

[a] Does not include Aides unless otherwise noted
[b] does not include "instructional facilitator"
[c] Aids only provided for At-Risk Students
[d] Class sizes for low poverty (4.5%) school
[e] Average across multiple proposals (teams)

Data Sources: Baker, 2006

Similar issues emerge in comparing proposed additional staffing related to the presence of at-risk children. Most input based studies recommend adding one teacher per twenty children from economically disadvantaged background. Again, some studies recommend much less additional support.

As with pupil weights across existing funding formulas, it can be very difficult to make apples to apples comparisons of cost study findings. Similar methods are useful for normalizing the relationship between poverty and cost, or LEP/ELL and cost across cost studies. Need effect analysis in particular can be a useful tool. To create comparable measures across studies, we first convert district or school level dollar per pupil cost estimates to cost indices, centered around the median cost:

$$\textbf{Cost Index}_d = \textbf{Cost per Pupil}_d / \textbf{Median Cost per Pupil}_s$$

That is, the cost index for each school or district is equal to the cost per pupil in that school or district [d], divided by the median cost per pupil for the state [s]. As such, a district or school with a cost index of 1.2 would have costs per pupil that are 20 percent above the median costs. Ideally, the median costs represent the cost per pupil in the district of median characteristics, of achieving the desired state outcome levels. One can convert the school or district level findings of any state-specific cost study to such a cost

index. Further, one can convert the actual expenditures or revenues per pupil of schools or districts in any given state to an *implicit cost index* by dividing each school or district's actual revenues or expenditures by the median.

Next, one can evaluate the statistical relationship between the cost indices and cost factors like school or district size, poverty or LEP/ELL concentrations. When exploring student population characteristics, one would eliminate small schools or small districts to focus on the slope related to student characteristics alone. The following table creates cost indices from district and school level findings from twelve separate cost studies (those where school or district level findings were available). This table includes the slope (need effect) of the relationship between school or district cost indices and the r-squared value for the relationship to indicate how strong the relationship between cost and poverty *should be.* In effect, the analyses presented in the previous section, where we calculated the relationship between current funding and poverty yielded a measure of *What Is.* And the present analysis in provides the measure of *What should be.*

Studies applying statistical modeling to the cost of educational outcomes typically yield a slope between poverty and cost index at the district level of greater than 0.60 with an r-squared of greater than .60 (other legitimate cost factors intervene to reduce this value in some cases). That is, typically, using free and reduced lunch as the count method, the district with 100 percent subsidized lunch rate has outcome-costs per pupil double those of the district with 0 percent subsidized lunch. Further, among scale-efficient districts, poverty alone may explain the vast majority of differences in the cost of educational outcomes, likely because poverty measures serve as such strong sociological proxies for a variety of conditions facing schools and districts.

Presently available school-level cost function analyses are not available for examination and replication. However, preliminary analyses on schools one state indicate a potential subsidized lunch cost-effect around 40 percent, with an r-squared around .60. That is, like district-level estimates, school-level estimates across similar schools by configuration (scale-efficient elementary schools) show that poverty is a major driver of the cost of educational outcomes and that costs in a school of 100 percent subsidized lunch are significantly greater than costs in a school of 0 percent subsidized lunch.

Relationship between Median Centered Indexed Costs and Subsidized Lunch Rates (K-12 Districts Enrolling >2,000 Students, not weighted)

Normalized Marginal Costs related with Poverty Across Selected Studies

			Relationship between Indexed Costs & Subsidized Lunch Rates[a]	
State	*Unit of Analysis*	***Method***	***Need Effect***	***R-squared***
Minnesota	District	Cost function, Ruggiero (2004)	0.855 [b]	0.468
Kansas	District	Cost Function, Duncombe & Yinger (2006)	0.799	0.769
Texas	District	Cost Function, Rescchosky & Imazeki (2004)	0.739	0.610
New York	District	Cost Function, Duncombe & Yinger (2004)	0.687	0.385
Nebraska	District	Cost Function (2005)	0.660	0.849
Texas	District	Resource Cost, Smith & Guthrie (2004)	0.624	0.707
Nebraska	District	Resource Cost, Augenblick & Colleagues (2002)	0.611	0.694
Kansas	District	Resource Cost, Augenblick & Colleagues (2002)	0.598	0.697
Washington	SCHOOL (Enroll >400)	Tentative estimate (Bruce D. Baker)	.37 to .40 [c]	0.610 [c]
Hawaii	SCHOOL	Baker and Thomas	0.40	
New York	District	Resource Cost (2004)	0.381	0.283
Texas	District	Cost Function (2004)	0.354	0.741
Arkansas	District (based on SCHOOL)	Resource Cost (2004)	0.176	0.780

[a] SY2000 Subsidized Lunch Rate (NCES Common Core of Data, Fiscal/Non-Fiscal Longitudinal File)
[b] Slope decreases dramatically when Minneapolis and St. Paul are removed from analysis, even when analysis is not weighted by district enrollment
[c] Preliminary findings.

Data Sources: Baker, 2006

Sorting out Urban and Rural Poverty Costs

There is yet to be any clear generalizable method for estimating differences in poverty related costs in urban versus rural environments, but there is evidence to suggest that marginal costs may differ across these environments and sufficient evidence to suggest the likely need for larger poverty weights in concentrated poor urban environments.

Two reasonable explanations for this include (a) the different sociological nature of concentrated urban versus rural poverty and (b) the average school setting into which children of economically disadvantaged backgrounds are integrated. On the first point, the concentration of poverty may be associated with an overall decline of social capital in a community, requiring greater leverage both through school and community services to make a difference in the lives of children. Even where inter-generational rural poverty exists, coupled with similar concerns over community social capital, in a schooling

system that provides sufficient support for small schools, rural children typically have the advantage of attending schools with smaller class sizes to begin with. Now let us turn to what our multiple approaches found in Rhode Island.

Successful School Approach

The process of identifying expenditure information for schools meeting specified performance measures is know as the "successful school/school district" method for determining adequacy. Successful school studies have been conducted in a number of states, most notably by state legislatures in recent years. The greatest strength to the method is its face validity. The underlying concept is that successful schools should form the model by which others are funded in that, if carefully designed, such a model should account for a variety of fiscal and educational issues. Performance measures should provide information on all students in an education system. In addition, the successful school model should take into account student demographics.

The successful schools analyses undertaken in this study provides valuable insights into the expenditures required to provide a quality education in Rhode Island. The following provides information on the sample universe used in this analyses, data elements and collection, definitions of success, how student demographics were taken into account, and the results of the analyses.

Sample Universe

- As RIDE continues to create its data warehouse, we were able to obtain school level finance data and compare it to performance data for 283 schools serving 140,404 students.
- This does not capture all of the 154,045 students in Rhode Island or the 306 schools providing performance information.
- However, it does account for 91.1 percent of all students in 92.5 percent of the schools with performance data. More than enough to designate a base student allocation from the results.
- In addition, expenditure data were limited to the 2004-05 school year.
- In the 283 schools that serve 140,404 students the average expenditure was $11,508 per-pupil (est. 07-08$) and the special student populations were 35.1 percent F&R, 5.3 percent ELL, and 17.8 percent special education.
- It should be noted that transportation and facility costs were not included in our analyses.
- Also, in order to arrive at the costs for the 2007-08 school year we inflated the 04-05 expenditures by 11.7 percent. This inflation rate is based on the historic comparable wage index increases in Rhode Island. While other inflation increases can be based on CPI and other more appropriate measures, the variation would be minimal.
- In addition, schools with the top and bottom 5 percent in expenditures for each group were removed from our analyses so that outliers would not distort the results.
- All expenditure data in this section are for the 2007-08 school year.

The following tables provide an overview of school poverty groupings and the characteristics of successful schools in Rhode Island. As can be seen, those schools that are classified as "High Performing" have significantly lower percentages of free and reduced lunch students.

Distribution of Schools and Students by Poverty Grouping

Poverty Group	Elementary	High School	Middle School	Mean Across Levels
Schools				
Under 10%	33	16	12	61
10% to 20%	46	8	9	63
20% to 30%	30	4	8	42
30% to 50%	29	5	6	40
Over 50%	62	14	14	90
Total	200	47	49	296
Enrollment				
Under 10%	11,238	17,359	7,528	36,125
10% to 20%	14,692	8,809	6,005	29,506
20% to 30%	8,712	5,137	5,278	19,127
30% to 50%	7,746	4,911	4,433	17,090
Over 50%	22,781	7,677	10,364	40,822
Total	65,169	43,893	33,608	142,670

Data Sources: RIDE

Characteristics of Schools by Performance Group

Performance Group	Schools	Enrollment	Poverty Rates	LEP/ELL
High and Commended	52	23,107	11.8%	0.8%
High	98	44,095	17.4%	1.1%
High with Caution	10	5,916	18.1%	0.6%
Other	129	68,290	54.5%	10.2%
All	289	141,408	34.4%	5.4%

Data Sources: RIDE

Comparison of % Subsidized Lunch by
Grade Level and Performance Group

Performance Group	**Elementary**	**High School**	**Middle School**	**Mean Across Levels**
High and Commended	9.0%	17.2%	11.7%	11.8%
High	20.5%	5.7%	19.9%	17.4%
High with Caution	13.4%	.	21.2%	18.1%
Other	68.2%	33.5%	75.2%	54.9%
All	39.7%	25.7%	37.3%	34.8%

Snapshot: **High performing schools generally had much lower poverty levels than other schools, statewide, at all grade levels.**

Data Sources: RIDE

Taking Student Demographics into Account

As previously noted, one of the major critiques of the successful schools approach as utilized in certain studies is that performance and expenditure information do not account for differences in student characteristics and demographics. In order to overcome this limitation of how the model was conducted, the creation of discount rates were formed to address differences in special student populations.

Applying "Discount Rates" to the Successful School Approach

Most reasonable individuals would agree that certain special student populations will require additional resources in order to provide adequate learning opportunities. For example, a school with 50 percent free and reduced lunch students, 20 percent special education, and 10 percent Limited English Proficiency students will require a higher per-pupil expenditure in order to succeed than a school with half as many at-risk students. Therefore, simply examining per-pupil expenditures of successful and non successful schools without adjusting for student demographics is an invalid means of determining how much is required in order for schools to meet performance standards and provide a quality education.

To overcome this limitation, and provide a more valid comparison between successful and non-successful schools discount rates were applied. Specifically, we applied two sets of criteria for two separate discount rates. The first discount rate assumes that those students eligible for the federal free and reduced lunch program and English language

learners cost 25 percent more to educate, resulting in a 25 percent discount rate for free and reduced lunch students. This percentage for free and reduced lunch students was based on an analysis of additional funding provided by states across the country.[9] While it must be noted that variation existed among states in the additional percentage of funding provided for free and reduced lunch students, and some states also took into account concentration of poverty, the 25 percent additional funding was the most commonly used, was close to the mean, and is seen as a "standard of practice" in the field of education finance.[10]

Furthermore, the discount rate assumed that special education students cost 100 percent more to educate and was based on research conducted by the Center for Special Education Finance. Specifically, the Center for Special Education Finance's Special Education Expenditure Project found that spending for special education students across the country was 1.9 times that of regular education students for the 1999-2000 school year.[11] The 90 percent more spent on special education students was increased to 100 percent for the discount rate utilized in this study due to the significant increases in health care costs that have occurred since the 1999-2000 school year. These factors can be more finitely determined in the creation and computation of the actual state aid distribution formula and further adjusted for more up to date data and the use of student weights. For the second discount rate, we assumed that students eligible for the free and reduced lunch program and English language learners cost 40 percent more to educate. This percentage was based on a variety of research that proposes that the current standard of practice (i.e. 25 percent) underestimates the additional costs for such students. For special education students, we assumed 110 percent more was required when applying the second discount rate.

Example Applications of Discount Rates

Two hypothetical schools in Rhode Island are illustrated with different expenditures and percentages of free and reduced lunch students, English language learners, and special education students. School "A" is deemed "Successful" and School B "Non-Successful".

	Enrollment	Per-Pupil Exp.	%Free & Reduced	% ELL	%Sp. Ed.
School A (Successful)	300	$9,500	10%	2%	16%
School B (Non-Successful)	300	$10,000	40%	8%	20%

[9] *Education Finance Database.* National Conf. of State Legis. Available from WWW: http://www.ncsl.org/programs/educ/ed_finance/index.cfm

[10] *Education Finance Database.* National Conf. of State Legis. Available from WWW: http://www.ncsl.org/programs/educ/ed_finance/index.cfm

[11] J Chambers, T. Parrish, *What Are We Spending on Special Education Services in the United States, 1999-2000?* U.S. Dept. of Educ., Office of Special Educ. Programs. (2004).

At first glance, one may incorrectly assume that successful schools spent less than the non-successful schools, and therefore money does not matter. However, an examination of this concept reflects that this is not the case.

Step One:
Identify total expenditures for each school
Successful School 300 students x $9,500 = $2,850,000
Non-Successful School 300 students x $10,000 = $3,000,000

Step Two:
Apply first discount rate percentages
Successful School 10% Free and Reduced students x 300 = 30 times 25% = 7.5
2% ELL x 300 students = 6 times 25% = 1.5
16% Special education x 300 = 48 times 100% = 48

Non-Successful School 40% Free and Reduced students x 300 = 120 times 25% = 30
8% ELL x 300 students = 24 times 25% = 6
20% Special education x 300 = 60 times 100% = 60

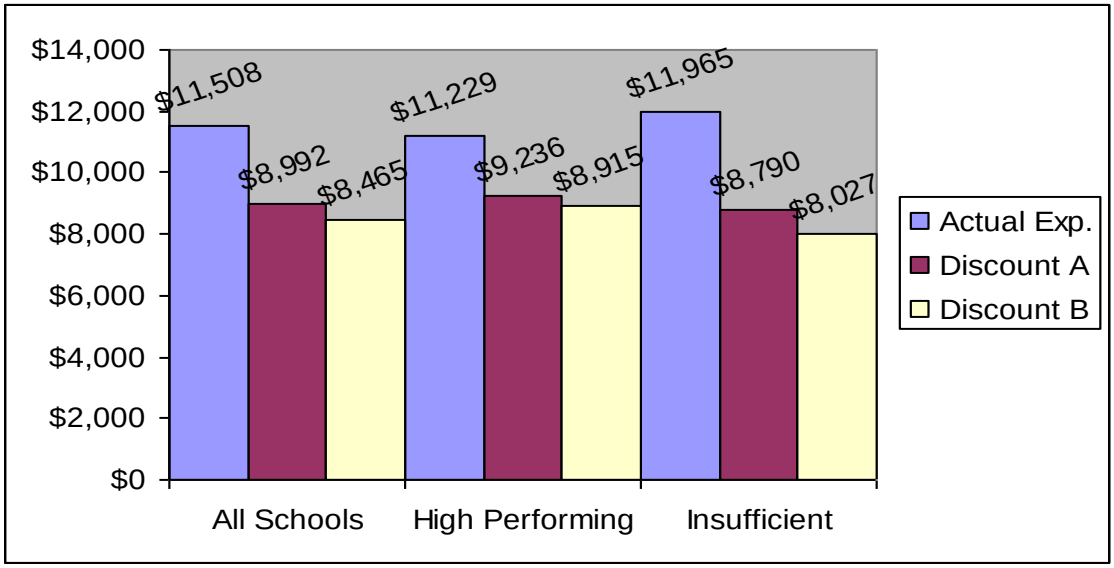
Step Three:
These "additional student weights" are then summed
Successful School 7.5 (F&R) + 1.5 (ELL) + 48 (sp. Ed.) = 57
Non Successful School 30 (F&R) + 6.0 (ELL) + 60 (sp. Ed.) = 96
Step Four:
Add the additional student weights to the school's enrollment to arrive at total weighted student count:
Successful School 300 + 57 = 357
Non-Successful School 300 + 96 = 396

Step Five:
Divide the total school expenditure by the weighted student count for each school:
Successful School $2,850,000/357 = $7,983
Non-Successful School $3,000,000/396 = $7,576

This examination reflects when the discount rate is applied; successful schools are actually spending 5.38 percent more than the non-successful schools.

The following section provides information on the differences in expenditures between successful and non-successful schools with and without the application of the two discount rates previously outlined.

Comparison of Expenditures (top and bottom 5% excluded) for All Schools, "High Performing" and "Insufficient Progress" Schools:



Discount Rate A = 25% for F&R and ELL and 100% for Special Education
Discount Rate B = 40% for F&R and ELL and 110% for Special Education

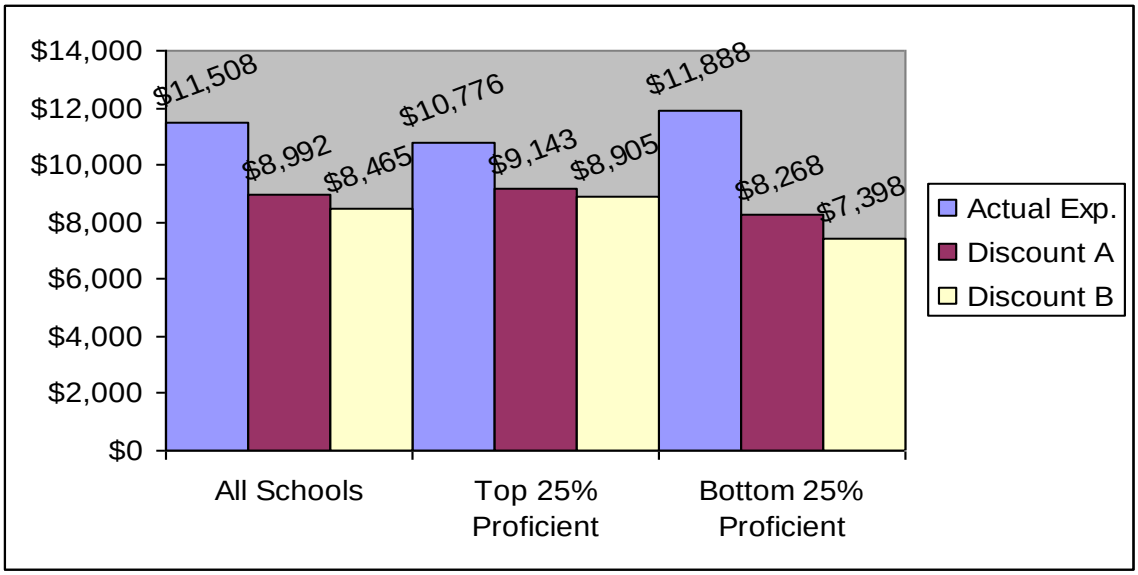
All Schools	35.7%F&R	5.6%ELL	17.6% Spec. Ed.	255 schools
High Performing	16.7%F&R	1.0%ELL	17.1% Spec. Ed.	144 schools
Insufficient	61.6%F&R	13.1%ELL	17.4% Spec. Ed.	52 schools

As the previous chart reflects, without taking special student populations into account, those schools classified as "high performing" are actually spending less then all schools combined and schools classified as "insufficient," once the discount rates are applied, "high performing" schools are actually spending more.

In order to determine how this would influence the total required spending for an adequate education, we examined the differences between the "high performing" (i.e. successful schools) expenditures and the expenditures for all schools.

For example, "high performing" schools spend $9,236, or 2.7 percent more than the $8,992 for all schools using discount rate A. Using discount rate B, "high performing" schools spend 5.3 percent more than all schools. ($8,915 compared to $8,465). While these results are interesting, we believe that calculating the total required adequate funding via analysis of school level (i.e. elementary, middle, and high schools) will provide a more accurate result. The following two charts provide information on elementary, middle, and high schools in the aggregate, and then we will turn to specific school level results.

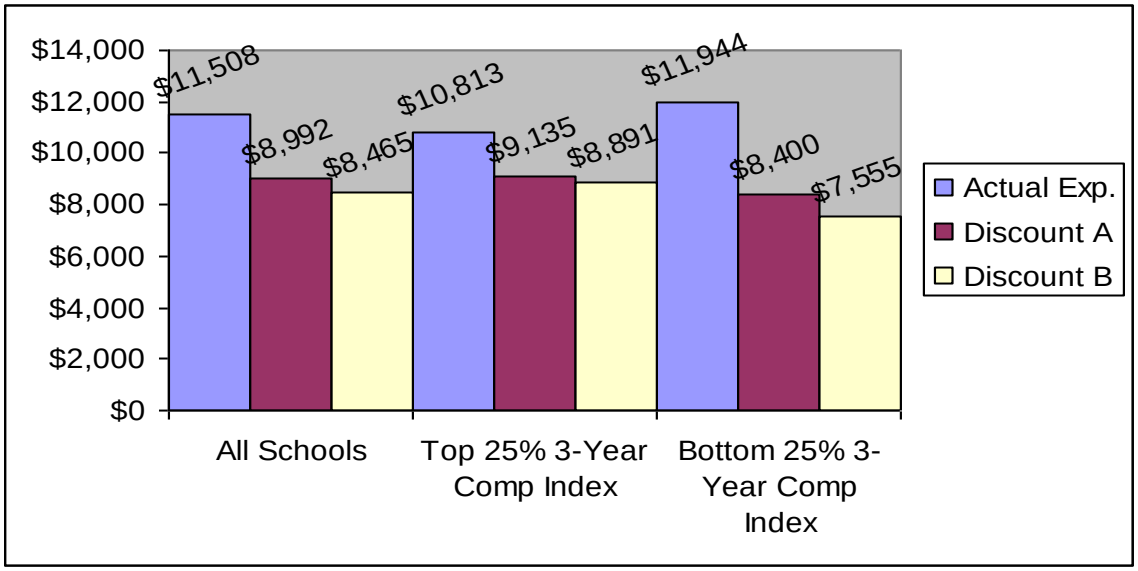
Comparison of Expenditures for All Schools, top 25% Combined Proficiency, and Bottom 25% Combined Proficiency



All Schools	35.7%F&R	5.6%ELL	17.6% Spec. Ed.	255 schools
Top 25%	10.2%F&R	0.7%ELL	15.1% Spec. Ed.	63 schools
Bottom 25%	81.5%F&R	18.7%ELL	18.7% Spec. Ed.	63 schools

Results:
1.7% increase using Discount Rate A
5.2 % increase using Discount Rate B

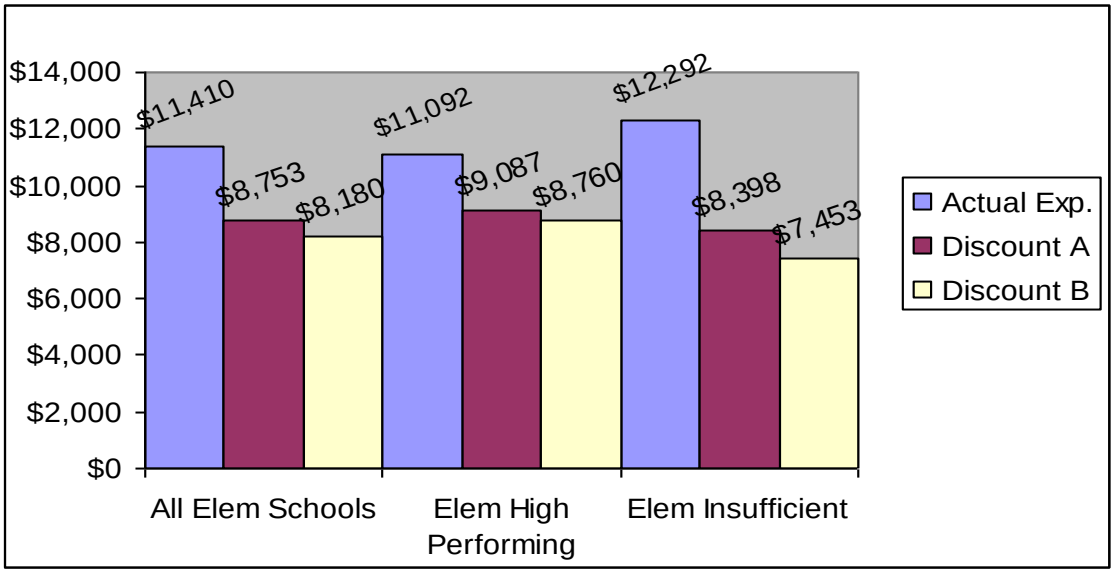
Comparison of Expenditures Based on Combined ELA and Math 3-Year Composite Index



All Schools	35.7% F&R	5.6%ELL	17.6% Spec. Ed. 255 schools
Top 25%	10.6%F&R	1.0%ELL	15.5% Spec. Ed. 63 schools
Bottom 25%	76.4%F&R	17.0%ELL	18.8% Spec. Ed. 63 schools

Results:
1.6% increase using Discount Rate A
5.0% increase using Discount Rate B

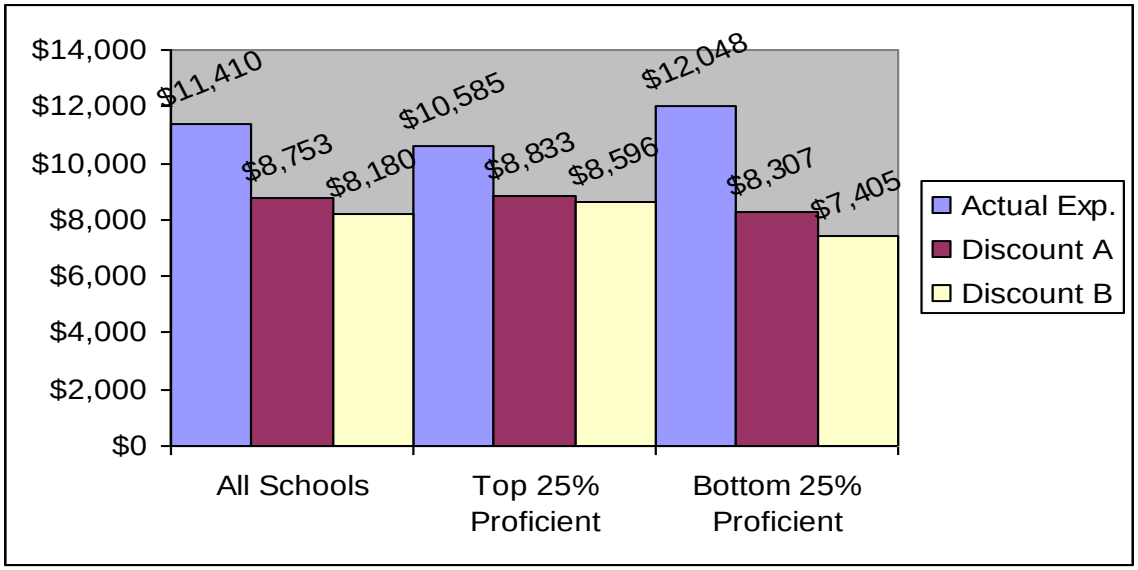
Comparison of Expenditures for All Elementary Schools, "High Performing" and "Insufficient Progress"



All Elementary Schools	41.1%F&R	7.8%ELL	18.1% Spec. Ed.	170 schools
High Performing	17.3%F&R	1.4%ELL	1 7.4% Spec. Ed.	96 schools
Insufficient Progress	86.9%F&R	24.5%ELL	18.5% Spec. Ed.	23 schools

Results:
3.8% increase using Discount Rate A
7.1% increase using Discount Rate B

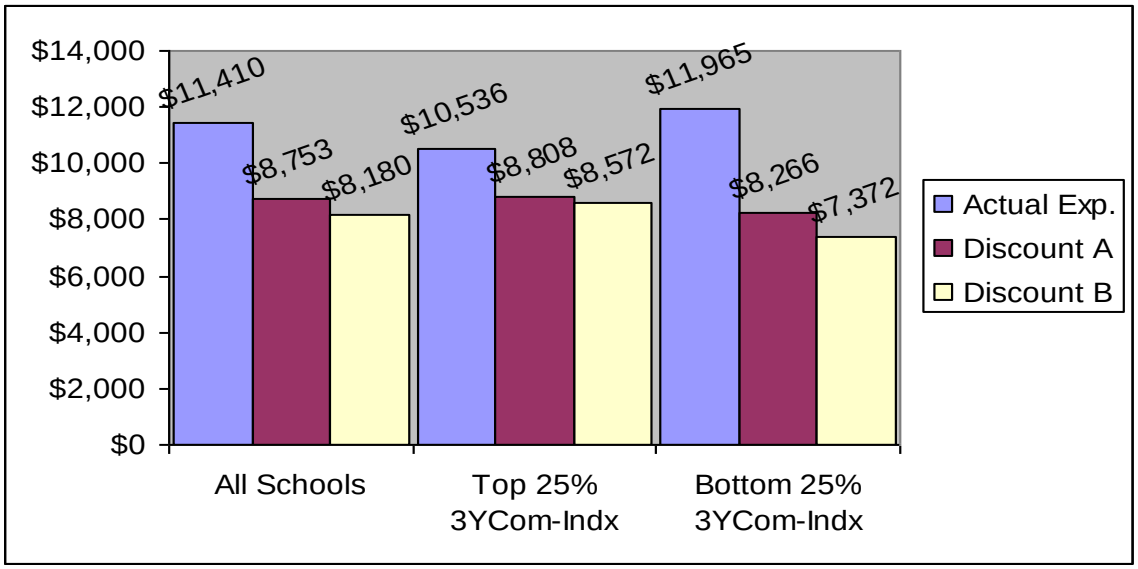
Comparison of Expenditures for All Elementary Schools, top 25% Combined Proficiency, and Bottom 25% Combined Proficiency



All Elementary Schools	41.1%F&R	7.8%ELL	18.1% Spec. Ed.	170 schools
Top 25% Proficient	9.8% F&R	0.7%ELL	17.2% Spec. Ed.	43 schools
Bottom 25% Proficient	83.1%F&R	22.2%ELL	18.7% Spec. Ed.	43 schools

Results:
0.9% increase using Discount Rate A
5.1% increase using Discount Rate B

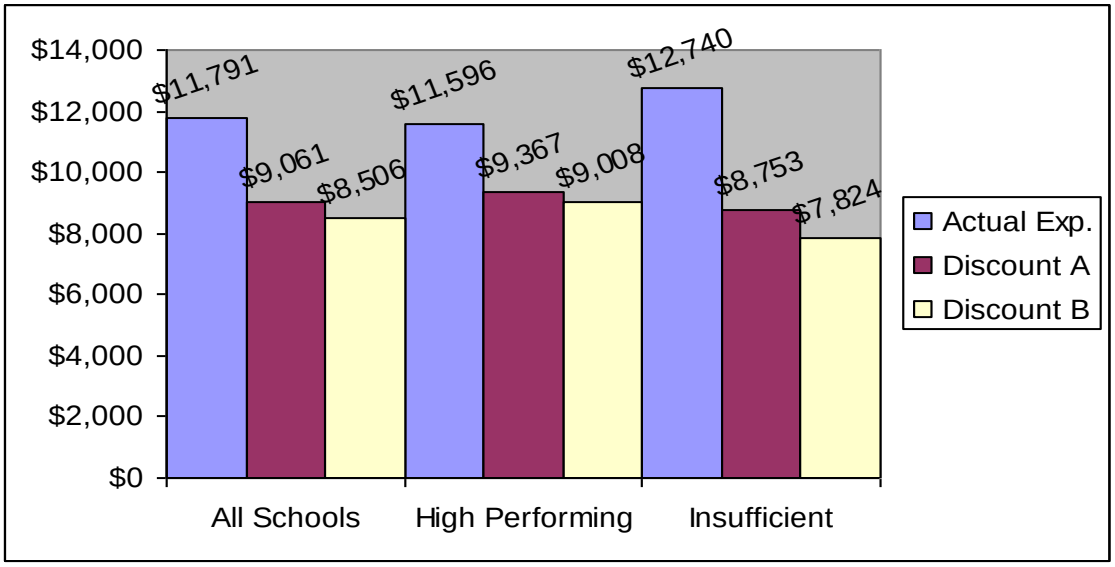
Comparison of Expenditures for All Elementary Schools, top 25% Combined 3 Year Index, and Bottom 25% Combined 3 Year Index



All Elementary Schools	41.1%F&R	7.8%ELL	18.1% Spec. Ed.	170 schools
Top 25% Proficient	9.6%F&R	1.1%ELL	16.9% Spec. Ed.	43 schools
Bottom 25% Proficient	83.4%F&R	2 1.2%ELL	18.6% Spec. Ed.	43 schools

Results:
0.6% increase using Discount Rate A
4.8% increase using Discount Rate B

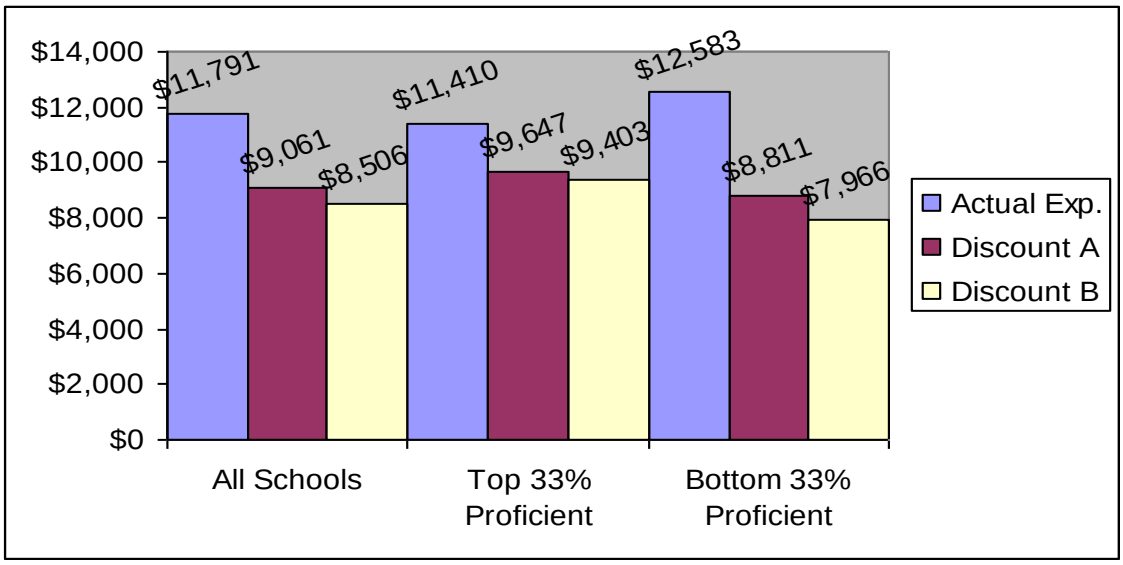
Comparison of Expenditures for All Middle Schools, "High Performing" and "Insufficient Progress" Schools



All Middle Schools	39.1%F&R	4.7%ELL	19.2% Spec. Ed.	45 schools
High Performing	19.4%F&R	1.0%ELL	18.7% Spec. Ed.	26 schools
Insufficient Progress	86.3%F&R	15.4%ELL	20.1% Spec. Ed.	8 schools

Results:
3.4% increase using Discount Rate A
5.9% increase using Discount Rate B

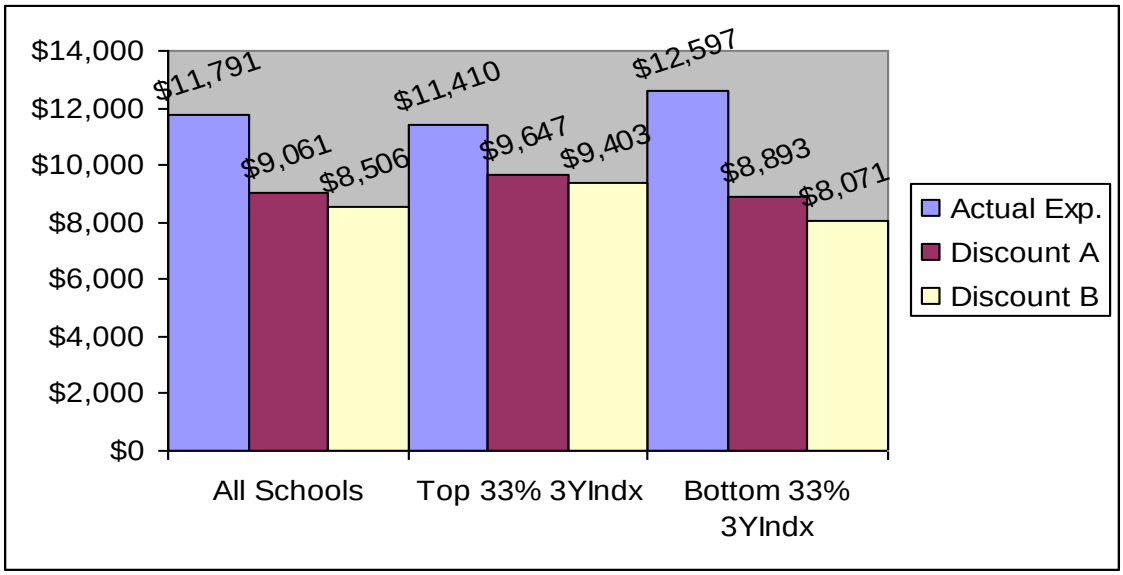
Comparison of Expenditures for All Middle Schools, top 33% Combined Proficiency, and Bottom 33% Combined Proficiency



All Middle Schools	39.1%F&R	4.7%ELL	19.2% Spec. Ed.	45 schools
Top 33% Proficient	9.6%F&R	0.3%ELL	15.8% Spec. Ed.	15 schools
Bottom 33% Proficient	70.4%F&R	11.8%ELL	21.5% Spec. Ed.	15 schools

Results:
6.5% increase using Discount Rate A
10.5% increase using Discount Rate B

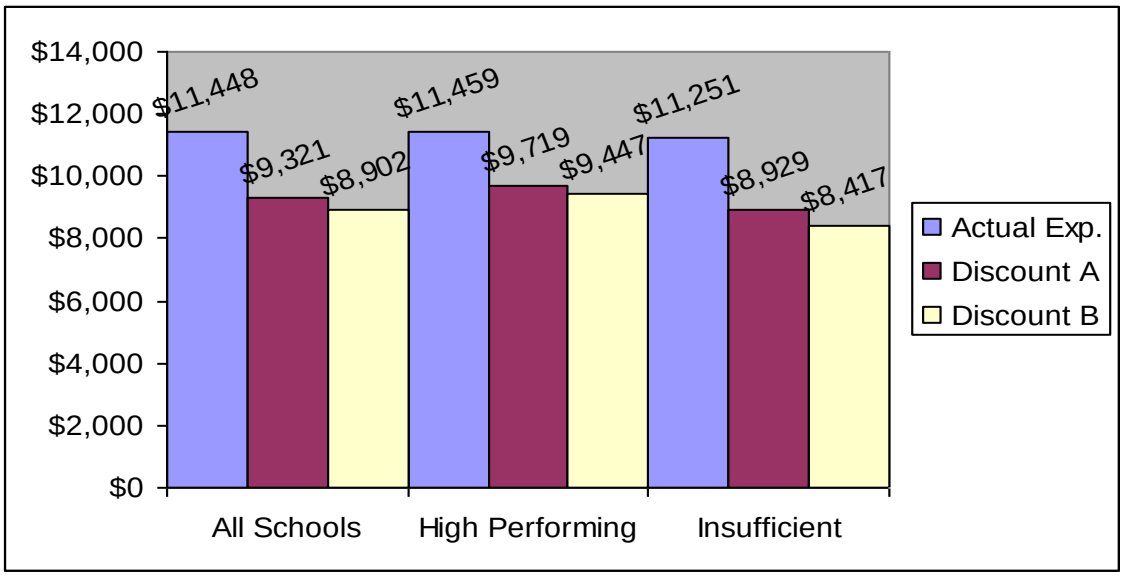
Comparison of Expenditures for All Middle Schools, top 33% Combined 3 Year Index, and Bottom 33% Combined 3 Year Index



All Middle Schools	39.1%F&R	4.7%ELL	19.2% Spec. Ed.	45 schools
Top 33% Proficient	9.6%F&R	0.3%ELL	15.8% Spec. Ed.	15 schools
Bottom 33% Proficient	70.3%F&R	11.9%ELL	21.1% Spec. Ed.	15 schools

Results:
6.5% increase using Discount Rate A
10.5% increase using Discount Rate B

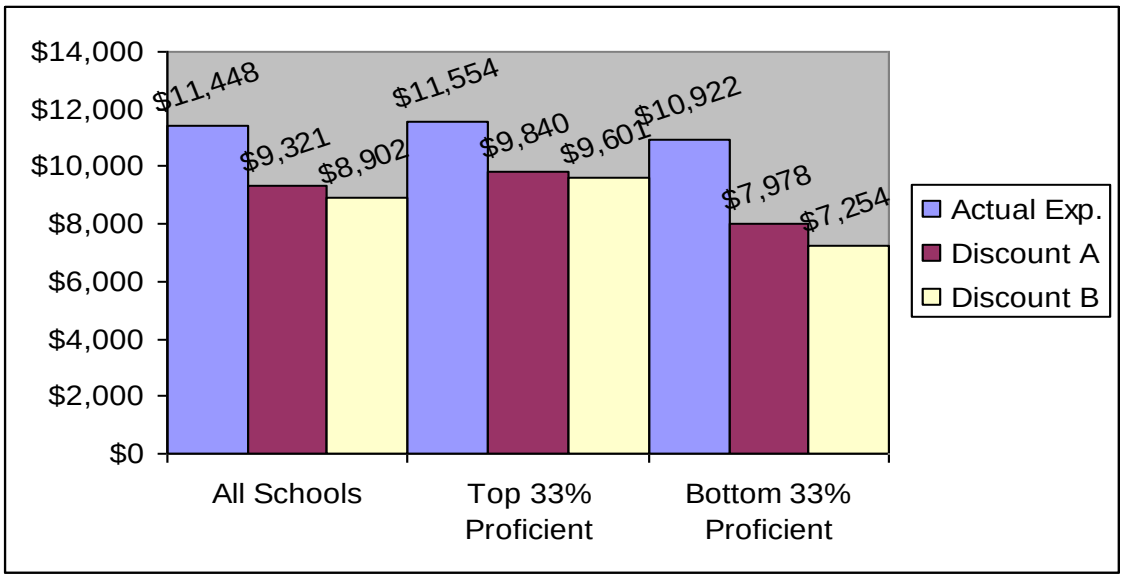
Comparison of Expenditures for All High Schools, "High Performing" and "Insufficient Progress"



All High Schools	25.0%F&R	3.1%ELL	15.8% Spec. Ed.	42 schools
High Performing	12.5%F&R	0.3%ELL	14.7% Spec. Ed.	12 schools
Insufficient Progress	35.0%F&R	5.5%ELL	15.9% Spec. Ed.	20 schools

Results:
4.3% increase using Discount Rate A
6.1% increase using Discount Rate B

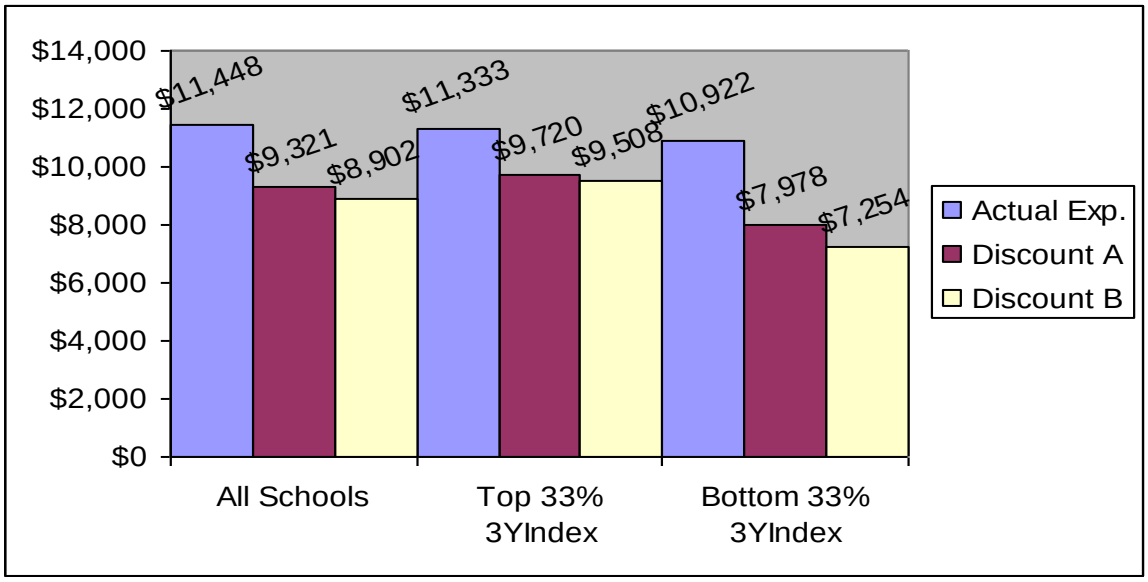
Comparison of Expenditures for All High Schools, top 33% Combined Proficiency, and Bottom 33% Combined Proficiency



All High Schools	25.0%F&R	3.1%ELL	15.8% Spec. Ed.	42 schools
Top 33% Proficient	9.0%F&R	0.4%ELL	15.1% Spec. Ed.	13 schools
Bottom 33% Proficient	67.7%F&R	12.2%ELL	16.9% Spec. Ed.	13 schools

Results:
5.6% increase using Discount Rate A
7.9% increase using Discount Rate B

Comparison of Expenditures for All High Schools, top 33% Combined 3 Year Index, and Bottom 33% Combined 3 Year Index



All High Schools	25.0%F&R	3.1%ELL	15.8% Spec. Ed.	42 schools
Top 33% Proficient	9.6%F&R	0.3%ELL	15.8% Spec. Ed.	15 schools
Bottom 33% Proficient	70.4%F&R	11.8%ELL	21.5% Spec. Ed.	15 schools

Results:
4.3% increase using Discount Rate A
6.8% increase using Discount Rate B

Total Increases Required Using Discount Rate A

.

	Enrollment	Per-Pupil Exp.	Total Exp.	High Performing	Proficient	3-Year Index	Average
Elementary School	67,498	$11,410	$770,152,180	3.8%$29.4M	0.9%$7.0M	0.6%$4.8M	1.8%$13.8M
Middle School	37,769	$11,791	$445,334,279	3.4%$15M	6.5%$28.8M	6.5%$28.8M	5.4%$24.2M
High School	46,956	$11,448	$537,552,288	4.3%$23.M	5.6%$29.9M	4.3%$23.M	4.7%$25.3M
Totals	152,223		$1,753,038,747	$68.4M	$65.8M	$56.7M	$63.3M

Total Increases Required Using Discount Rate B

	Enrollment	Per-Pupil Exp.	Total Exp.	High Performing	Proficient	3-Year Index	Average
Elementary School	67,498	$11,410	$770,152,180	7.1%$54.6M	5.1%$39.2M	4.8%$36.9M	5.7%$43.6M
Middle School	37,769	$11,791	$445,334,279	5.9%$26.3M	10.5%$47M	10.5%$47M	9.0%$40.1M
High School	46,956	$11,448	$537,552,288	6.1%$32.9M	7.9%$42.2M	6.8%$36.6M	6.9%$37.2M
Totals	152,223		$1,753,038,747	$113.8M	$128.3M	$120.5M	$120.9M

As the table reflects, the required increase in funding based on the application of discount rates, and then comparing successful schools to school average percentages ranges from $56.7 to $128.3 million.

The following table also shows how schools with various percentages of free and reduced lunch students spend in order to be classified “high performing.” It should be noted that special education costs are within these expenditures and accounts for the differences in total expenditures when compared to previous charts.

"High Performing" Successful School Expenditures by Poverty Groupings

By Poverty Group	Elementary	Middle School	High School	Mean Across Levels
Under 10%				
Avg. Current Expenditures	$9,807	$10,571	$11,230	$10,495
Standard Deviation	1,412	1,976	1,273	1,598
# Students in SS	10,914	7,528	9,443	27,885
# of SS	31	12	9	52
10% to 20%				
Avg. Current Expenditures	$11,505	$12,313	$11,832	$11,763
Standard Deviation	1,949	1,315	829	1,687
# Students in SS	13,638	6,005	3,042	22,685
# of SS	41	9	3	53
20% to 30%				
Avg. Current Expenditures	$11,463	$11,974	$12,659	$11,763
Standard Deviation	1,501	1,075 .		1,303
# Students in SS	7,670	5,278	1,325	14,273
# of SS	26	8	1	35
30% to 50%				
Avg. Current Expenditures	$13,066	$11,321	$9,638	$11,642
Standard Deviation	1,956	1,030	0	1,694
# Students in SS	2,334	3,488	1,099	6,921
# of SS	10	5	1	16
Over 50%				
Avg. Current Expenditures	$10,804 .	.		$12,068
Standard Deviation	799 .	.		799
# Students in SS	1,354	0	0	1,354
# of SS	4	0	0	4
Mean Across Poverty Groups				
Avg. Current Expenditures	$11,055	$11,489	$11,363	$12,567
Standard Deviation	1,847	1,578	1,204	1,649
# Students in SS	35,910	22,299	14,909	73,118
# of SS	112	34	14	160

Given that special education costs approximately $1,300 per student in Rhode Island, if we subtract that amount from the mean expenditure across levels for schools with less than 10 percent free and reduced lunch students ($10,465) we arrive at $9,195. This result is very close to the average we arrived at when applying Discount Rate A.

To provide an example of how these results could be used in a funding formula, let us assume a formula was created that used $9,250 as a base cost and a 25 percent weight for F&R lunch and ELL students, along with a 100% weight for special education. When compared to how much is actually being spent in Rhode Island, the new formula would require approximately $60 million in new funding.

Advanced Statistical (Cost Function) Approach

Data

Data for this portion of our study and for Successful Schools analysis were drawn from the downloadable Microsoft Access format files of detailed budget and actual expenditure data from Rhode Island's recent implementation of IN$ITE financial analysis software. Additional school site identifying data were requested for ensuring accurate linking of expenditure lines with school sites. In the IN$ITE databases, school sites as locations are identified by a location variable, but one that is not unique for schools across all districts. As such, we constructed a new variable (dist_loc) by combining "district_id" with "location" to create a school site-identifying variable that would be unique across all schools statewide. Having done this, we were then able to merge our IN$ITE financial data with the school identifying bridge file provided by RIDE and IN$ITE staff.

IN$ITE allows identification of two different "cost types" for each budget or expenditure line. There are those cost type items where costs are incurred and where resources are consumed/used at the school site level and there are those costs that may be incurred either at the school or district (central) level but are still allocated to, consumed/used at the school site level. For the latter costs, the cost "source" would be listed as the central office, but the effect of those resources would still be on the school level. We include all costs for which the cost type flag is "S" (for school site), even where some of those costs may be incurred (source) at the district level. However, costs such as transportation are not allocated down to school sites. Various function and program codes accounted for in our school level budgets are listed in Appendix.

To construct school site budgets, we sum all lines of school site actual (not budgeted) expenditures to the school site level. These school level data were then merged with school level student demographic data and with school level performance outcome data provided by RIDE. We compile a three-year panel of data, using financial and student demographic data from 2002-2003 to 2004-05. All performance outcome measures are not available in all years, but across schools performance outcome measures remain relatively stable over time. Where necessary, we replace missing performance outcome data with data from the subsequent year.[12]

[12] For example, using 2006 outcome data for elementary schools in 2005. Alternatively, we used regression models to impute 2005 outcomes for elementary schools using performance outcomes on the same schools in other years, including 2004 and 2006. Because the distributions of the imputed outcomes are nearly identical to those for 2006, the effect on our cost models of choosing imputed 2005 versus actual 2006 values to represent 2005 performance levels is negligible.

The following table shows that after compiling the data as discussed, we have sufficient, seemingly reliable school level expenditures per pupil for 297 schools. The table also shows the distribution of those schools by size and grade level.

Mean Size and Distribution of Schools by Type and Level
(School Level Cost Function Data)

	Elementary	Secondary	Middle	Total
Large				
Mean	472.00	1,441.94	928.56	712.34
St.Dev.	94.85	270.69	187.03	402.69
N	66	17	16	99
Medium				
Mean	307.79	910.59	656.53	467.95
St.Dev.	32.66	155.18	47.11	247.89
N	67	17	17	101
Small				
Mean	199.93	285.29	474.38	257.52
St.Dev.	42.79	155.69	86.35	126.38
N	67	14	16	97
Total				
Mean	325.85	916.40	685.88	480.69
St.Dev.	128.19	508.33	221.02	337.57
N	200	48	49	297

Methods

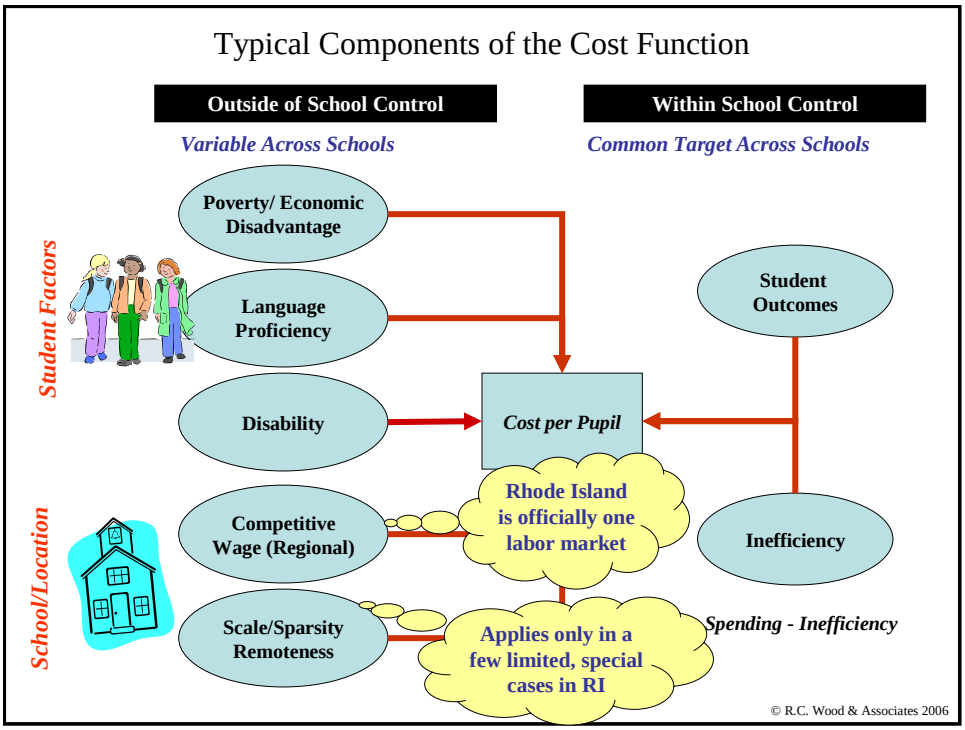
The following figures summarize the various types of factors that typically influence the "cost" of producing desired levels (or any given level) of educational outcomes across students clustered in schools and districts. Our Rhode Island analyses present us with a number of unique circumstances. In Rhode Island, there is significant variation in student population characteristics across schools and across districts. Unlike most previous literature applying cost function analysis, our analyses herein use school level data rather than district level data. Further, we have the advantage of relatively comprehensive school site financial data including both personnel and non-personnel expenses. Previous school site cost function analyses in two states have used school site budgets computed from state administrative data on certified and non-certified staffing assignments and salaries, and did not include non-staffing expenses at the school site.

Unlike most other states in the country, when using the "labor market" classification system recently adopted by the National Center for Education Statistics (NCES) for its new Comparable Wage Index (CWI), Rhode Island qualifies as a single labor market. That the state is geographically small removes one significant complexity from cost function modeling. In Rhode Island, there is no need to account for regional wage variation from one side to the other of the state. However, this is not by any means to

suggest that there is no need to attend to localized wage variation associated with differences across districts in the price of hiring teachers with specific qualifications into widely varied work environments (such as poor urban versus affluent suburban schools). Such variation might be at least partially captured in student demographic variables in the cost models.[13]

In addition, given the state's average population density across counties, there is little need to account for the role of school or district size in influencing costs. We do account for school size in our models, but the choice of the legislature to fund the higher costs of small schools or districts is largely a question of policy preference and not one of necessity, but for a few unique cases (most notably, New Shoreham). Charter and alternative schools, especially during start-up years pose interesting questions regarding policy preferences, such as how long the state or any district should subsidize an inefficiently small school in a population dense area.

[13] One way to interpret student need weights or coefficients that arise from a cost function model is that the additional money predicted to be needed in high poverty schools or districts might be leveraged in two ways – increasing teacher quantity and increasing and retaining teacher quality. Class size research (teacher quantity) shows greater marginal gains in outcomes for certain children. Further, teacher labor market literature suggests the need for significant wage differentials for high poverty, high % minority schools simply to recruit and retain teachers of comparable qualifications (no less higher qualifications) to those in lower poverty, lower % minority schools. If, in a cost function model, we control separately for this needed wage differential, then the weight on student poverty will likely be smaller than if we do not separately account for such wage variation. In a cost function model with independent control for localized wage variation, the resultant poverty weight need only account for necessary staffing quantity differences. Unfortunately, RIDE lacks sufficient teacher level data (both on academic credentials of teachers and on actual compensation) to estimate necessary compensating differentials.



It should be noted that in our successful schools analysis, we used the same site based spending data to calculate the average spending of schools by category (size, grade level and poverty), among those schools meeting 2008 outcome standards. Note also that in our successful schools analysis, in those cells where there were sufficient numbers of high poverty schools meeting standards, we saw a general pattern of higher per pupil spending in higher poverty schools who were meeting those standards. That spending differential might be interpreted as a weight, or potential underlying difference in the "cost" of achieving those outcomes in those schools.

The cost function is an extension of the successful schools analysis, where (a) we include a few more variables, (b) where we measure poverty, language proficiency, and disability variables more precisely by including the actual proportions rather than putting our schools into broad groups and (c) where we include the full range of outcome levels from the very low to very high instead of looking only at the subset of schools *at or above* a given threshold. In the cost function analyses, we are fitting a regression equation using multiple variables to predict school site spending levels, at existing levels of student outcomes. That is, we are constructing a statistical model, using three years of data on Rhode Island schools, where that model will describe the existing relationships between outcomes and spending levels, given student and school characteristics. The equation can be expressed as:

School Site Spending per Pupil = *f* (Outcomes, Students, Level, Size, Year)

Or perhaps more simply, that school site spending per pupil is a function of outcomes, student characteristics including poverty rates, LEP/ELL rates and disability rates, school

grade level and size. The year variable in this three-year model will capture the average annual rate of school site budget growth.

Cost = Spending – Inefficiency

It is important to recognize that both the successful schools and cost function analysis rely on spending data to measure costs. But, a school or district might in reality spend more money than would actually be needed at a minimum, to achieve a given level of outcomes. Those additional expenditures above and beyond the minimum required expenditures might be considered "inefficient" expenditures.

We urge caution in the interpretation of the term "inefficiency" in this context. For example, the successful schools analysis and cost function analysis focus only on the production of testing proficiency outcomes across a handful of content areas. As such, any school site expenditure that does not either directly or indirectly affect these particular outcomes positively might be construed as an inefficient expenditure. We do not, by any stretch, wish to imply that efficiency must be improved by targeting more resources directly toward achieving only those goals measured in our models. For that matter, existing education finance research provides us little insight as to whether spending school site money on *teaching to the test*, in math for example, yields any greater improvement on math outcomes than spending the same sum on music or art, which may contribute directly or indirectly to math outcomes. Physical education may similarly lead to indirect positive outcome effects.

Further, overemphasis on targeting funds toward narrow sets of tested outcomes can lead to dramatic inequities across schools in the availability of non-tested curricula. Quite simply, schools serving higher need student populations and feeling greater pressure to increase test performance in reading and math may be more likely to cutback on perceived peripheral, co-curricular, and extracurricular activities. We caution against trading inefficiency in producing test-score outcomes in select content areas for inequity across students and schools.

These caveats acknowledged, the methods herein require that we address the question of inefficiency empirically, with respect to our spending measure and the available outcome measures. Most, if not all, recent cost function analyses have attempted, either via direct or indirect measures, to sort out the extent to which school districts presently spend more than would be required, at a minimum, to achieve a given set of educational outcomes. Direct accommodations for efficiency include use of stochastic frontier cost models[14] and

[14] T. Gronberg, D. Jansen, L.Taylor and K. Booker *School Outcomes and Schools Costs: The Cost Function Approach*. (College Station, TX: Busch School of Gov, Texas A&M University, 2004). Retrieved March 1, 2006 from http://bush.tamu.edu/research/faculty_projects/txschoolfinance/papers/SchoolOutcomesAndSchoolCosts.pdf

Data Envelopment Analysis (DEA) frontier cost models.[15] Indirect attempts to account for efficiency differences often use competition density indices, such as a Herfindahl index to capture the extent that competition density among school districts should lead to greater efficiency[16] or a variety of fiscal capacity indicators of proximal or otherwise similar (geographically collocated) districts which may lead to inefficient ratcheting of spending.[17]

The latter approach– indirect controls for efficiency – is the preferred approach and widely accepted approach for district level cost function analysis in the research of education finance. Less precedent exists for school level analysis. The indirect approach deals conceptually with district decisions in district level budget setting and local property taxation. In short, some school districts more than others, have the luxury of spending inefficiently.[18] Such school district level decisions no doubt affect the budgets of schools in our analysis herein but do not necessarily account for variation in resources across schools within districts. Also, the two stage statistical method typically employed along with indirect controls for efficiency requires extensive preliminary analysis to identify a best possible set of district level efficiency controls and to identify relevant instruments for correcting bias in the student performance measures in the first stage of the model. Preliminary analysis of the Rhode Island expenditure and outcome data provide some statistical basis for beginning with simpler, single stage expenditure models (though with the highly technical sounding name *Stochastic Frontier Analysis*).[19] In

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[15] J. Ruggiero (2004) *Determining the Cost of an Adequate Education in Minnesota*. (Minneapolis, MN: Minnesota Center for Public Finance Res., Minnesota Taxpayers Assn, 2004).

[16] J. Imazeki and A. Reschovsky "Is No Child Left Behind and Un (or Under) Funded Federal Mandate? Evidence from Texas" *National Tax Journal* 57 (2004): 571-588

[17] W. Duncombe and J. Yinger *Estimating the Costs of Meeting Student Performance Outcomes Mandated by the Kansas State Board of Education*. (Topeka, KS: Kansas Legislative Division of Post Audit, 2006 – January) Retrieved March 1, 2006 from http://www.kslegislature.org/postaudit/audits_perform/05pa19a.pdf

[18] Either because they simply have the fiscal capacity to do so, or because they are spending someone else's money (state and federal aid, rather than local property tax dollars). Recent work in public finance clusters inefficiency factors into (a) fiscal capacity and (b) public monitoring [local public] variables.

[19] In technical terms, student outcomes and school spending are "endogenous." In the education production function, it is understood that student outcomes are a function of schooling characteristics (including financial resources), given student characteristics. The education cost function is an algebraic substitution in which we move outcomes to the independent variable list and spending to the dependent variable position (again, trying to separate out the inefficiency in spending). This creates a somewhat circular logic—spending affects outcomes (a preliminary statistical test run, and passed with the data used herein) and simultaneously, desired outcome levels affect how much one needs to spend. Outcomes in this model are conceptually endogenous and therefore contain bias (as a function of the influence of spending). A two-stage least squares

short, we have found a set of statistically reasonable excuses for avoiding unnecessary complexity.

For the models herein, we use stochastic frontier cost functions to estimate the relationship between outcomes and spending, given student and school characteristics. Stochastic Frontier Analysis is a regression-based method for fitting an equation between the various measures. The difference between a Frontier regression model and a typical regression (Ordinary Least Squares) model is where, through the data points, the regression trend-line is fit. In a typical regression analysis, a line of best fit is found through the middle of a scatter of points that represent the relationship between two or more variables. For example, in the following figure, the goal would be to estimate the straight line or curved line (as depicted) that fits through the individual points such that the differences between the various individual points (shown as schools) is minimized – the line or curve of best fit. In this particular scenario (or any done by this method), some schools will fall below and some above the curve. That is, some will achieve higher outcomes than expected given the spending level and some will spend more than expected given how much the are actually achieving in student outcomes. The line or curve represents the average (and is bent or curved to the extent that best represents the average).

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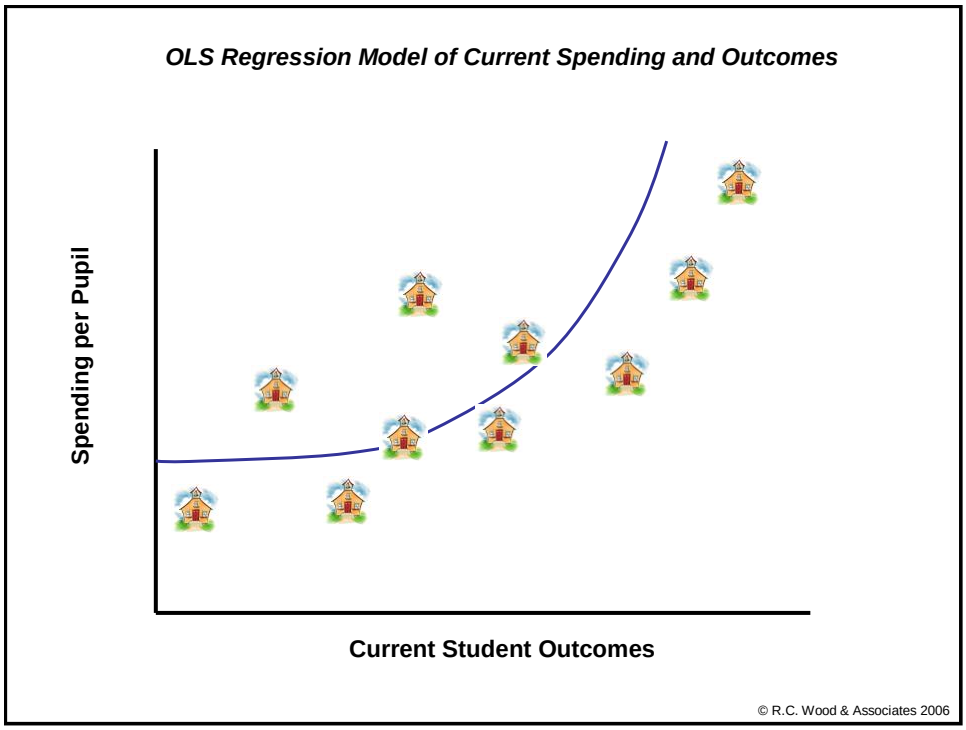
approach, or instrumental variables approach, uses a set of "exogenous" instruments to create, in a first stage regression model, predicted values for the outcome measure (conceptually removing the bias). Then those predicted values are used in the cost model. This approach is generally accepted for the education cost function. However, while this approach is conceptually appropriate (argued by some as conceptually required), common statistical tests of endogeneity often find outcome measures such as those herein not to be statistically endogenous, therefore not statistically requiring a two-stage least squares or instrumental variables approach. Gronberg et al. use this rationale for estimating a single stage model (using actual rather than predicted values of outcomes).



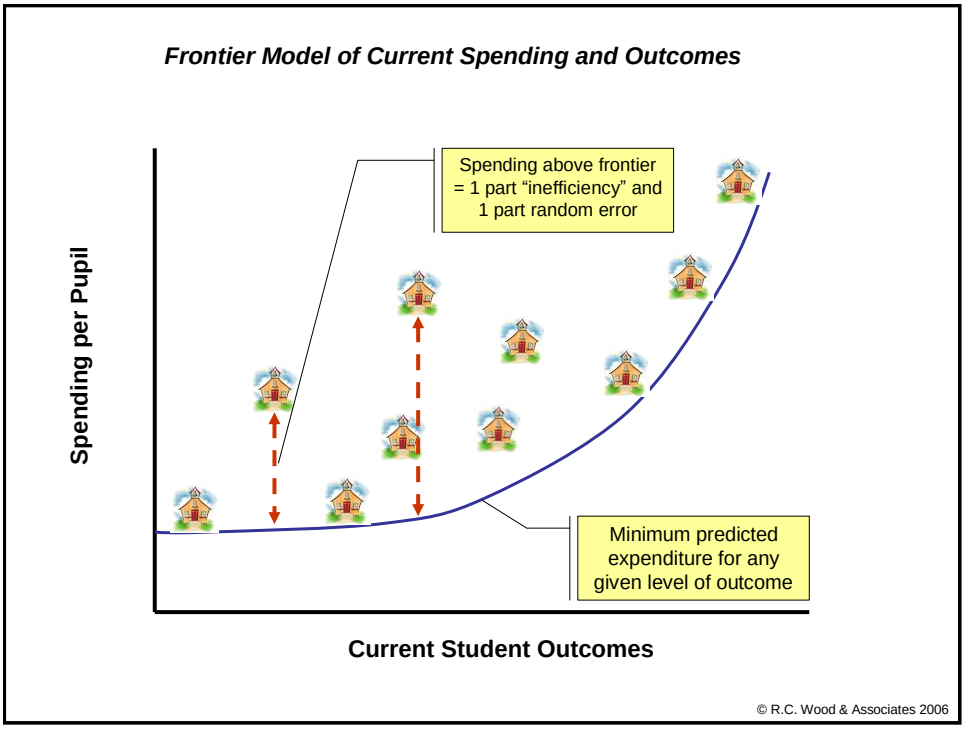
By contrast, one could fit the line or curve to the outer edge of the pattern of schools. One can do this with a "corrected" regression approach, with a "numerical maximization" approach (data envelopment analysis) or with a stochastic frontier approach. The following figure represents a frontier approach. In the frontier approach, the curve, in a cost model, is fit to the outer most edge of the most efficient producers of educational outcomes. In fitting the curve to the outer edge rather than through the middle, some frontier estimation methods may also identify a different shape to the curve.[20]

The question remains as to the meaning of the distance from each school to the frontier cost function. In SFA it is assumed that the distance from each school (or point) to the cost frontier consists of two parts. One part of the distance from actual school spending to the estimated minimum possible cost is considered to be random error.[21] The other part of the distance from each school's actual spending and the frontier is considered to be inefficiency – or the amount the school overspends toward achieving specific educational outcomes.

[20] A corrected regression approach would simply shift the original curve to the new location.

[21] A significant shortcoming of this method being that the researcher has to essentially guess – up front – what pattern or distribution of error most likely exists across schools in the sample. Most often, the default "normal/half-normal" error distribution is used. That is, in a typical regression it is assumed that the distribution of the errors around the trend line is normal – a bell curve above and below the trend line. Because we fit the curve or frontier to the outer edge instead of through the middle, the errors can be distributed in only one direction – half of the bell curve (hence normal/half-normal).

We note however, while it might seem appealing to try to use this approach and these measures to evaluate and rank the efficiency of Rhode Island schools, rigorous peer reviewed studies of the accuracy of such methods for measuring efficiency cast doubt on their usefulness. That said, other more popular (or more advertised) methods are even less accurate and less precise for rating school or district efficiency. We choose not to attempt, herein, to use our methods to compare or evaluate school efficiency, and instead to use the methods to derive reasonable predictions of the costs of producing desired outcome levels. We also note that what appears to be inefficiency might also be associated with characteristics of a school which we have failed to fully capture with the variables in our model (for example, remote location issues associated with New Shoreham schools which may not be captured by school size alone, or substantial differences in operating costs associated with facilities differences which may not feasibly be altered in the short term).



Findings

The following table displays the SFA regression coefficients for the first of two sets of models. Three separate models are shown in this table, the first using language arts proficiency rates, the second using math proficiency rates and the third combining the two. In each case, we see a positive coefficient between the outcome measure (percent proficient) and the school site spending measure (the dependent variable for all models). In short, this means that higher outcomes are associated with higher spending.

Also, we see a positive, statistically significant coefficient on each of our three student population measures. In short, these coefficients indicate that in schools with higher

percentages of LEP/ELL children, economically disadvantaged children or children with special education IEPs, the costs of achieving any given level of proficiency are higher. In effect, these coefficients may serve as pupil need weights in predicting the costs of desired outcomes.

We also see positive coefficients on the secondary school and middle school variables, suggesting that, at any given level of outcomes (proficiency rate), costs per pupil are higher in these schools than in elementary schools (as a baseline). This finding can have several meanings. First, in many state-testing systems, proficiency rates decline through grade levels. Concurrently, achievement gaps increase through grade levels, as a function of numerous factors including school quality differences. If Rhode Island policymakers wish to assume that proficiency rates in secondary and middle schools should match those in elementary schools, then the table suggests that per pupil costs are higher in higher grade levels. We leave open the possibility however, that increased financial resources might also be leveraged in lower grades toward achieving more equal and more adequate outcomes in higher grades.

In the model as shown we use a curved line based on the natural log of enrollment and natural log of enrollment squared to characterize the declining costs from very small to larger schools, at any given grade level. The subsequent addresses scale-related costs in categorical terms, showing margins for small and medium size schools relative to large, scale-efficient ones.

School Level Cost Models using IN$ITE Current Expenditure Data and Alternate Outcomes

	Language Arts			**Math**			**Combined**		
	Coef.	*Std. Err.*	*P>z*	*Coef.*	*Std. Err.*	*P>z*	*Coef.*	*Std. Err.*	*P>z*
Percent Proficient (ln)	0.066	0.038	**	0.058	0.024	*	0.066	0.032	*
Student Needs									
% Subsidized Lunch	0.159	0.047	*	0.180	0.046	*	0.165	0.042	*
% on IEP	0.726	0.141	*	0.726	0.140	*	0.709	0.142	*
% LEP/ELL	0.257	0.103	*	0.244	0.101	*	0.212	0.100	*
School Characteristics									
Elementary									
Secondary	0.130	0.031	*	0.134	0.030	*	0.142	0.032	*
Middle	0.110	0.023	*	0.112	0.022	*	0.110	0.022	*
Enrollment (ln)	-0.084	0.215		-0.065	0.214		-0.029	0.228	
Enrollment (ln) Squared	0.000	0.018		-0.001	0.018		-0.004	0.019	
Year = 2004	-0.032	0.014	*	-0.025	0.013	**	-0.014	0.014	
Year = 2005									
Constant	9.132	0.678	*	9.110	0.665	*	8.921	0.723	*

*p<.05, **p<.10
Estimation by Stochastic Frontier Cost Function (Stata 9.2)

The following table shows the SFA cost function results using the categorical grouping for school size. As one would expect, costs are marginally higher in medium and in

small schools compared to large, scale efficient ones. It can be difficult, however, to interpret from these tables, the effect of all of these coefficients on predicting costs per pupil in any given school.

School Level Cost Models using IN$ITE Current Expenditure Data and Alternate Outcomes

	Language Arts			Math			Combined		
	Coef.	*Std. Err.*	*P>z*	*Coef.*	*Std. Err.*	*P>z*	*Coef.*	*Std. Err.*	*P>z*
Percent Proficient (ln)	0.051	0.038		0.051	0.024	*	0.066	0.033	*
Student Needs									
% Subsidized Lunch	0.161	0.047	*	0.186	0.046	*	0.186	0.048	*
% on IEP	0.719	0.139	*	0.722	0.138	*	0.730	0.139	*
% LEP/ELL	0.232	0.102	*	0.224	0.100	*	0.235	0.101	*
School Characteristics									
Level									
Elementary									
Secondary	0.054	0.023	*	0.058	0.021	*	0.061	0.023	*
Middle	0.048	0.019	*	0.050	0.019	*	0.052	0.019	*
Size									
Medium	0.042	0.016	*	0.042	0.016	*	0.041	0.016	*
Small	0.083	0.017	*	0.084	0.017	*	0.083	0.017	*
Year = 2004	-0.032	0.014	*	-0.026	0.013	**	-0.030	0.013	*
Year = 2005									
Constant	8.677	0.179	*	8.671	0.115	*	8.562	0.181	*

*p<.05, **p<.10
Estimation by Stochastic Frontier Cost Function (Stata 9.2)

To interpret the effects of the SFA models, we use the estimated equations to generate predictions of the costs, and relative costs across schools of achieving a common outcome goal (rather than the different outcome goals they currently achieve). That is, we hold constant the proficiency rates of schools at RIDE 2008 desired levels. Because RIDE bases accountability standards on an indexing system not solely based on proficiency rates alone, we use regression models of the relationship between RIDE's index values and proficiency rates to impute the proficiency rates that would be most likely associated with required index levels in 2008. Needless to say, proficiency indices for math and language arts are highly associated in any given year with underlying proficiency rates across schools, by grade level (especially across scale efficient schools which also have sufficient numbers of test takers annually).

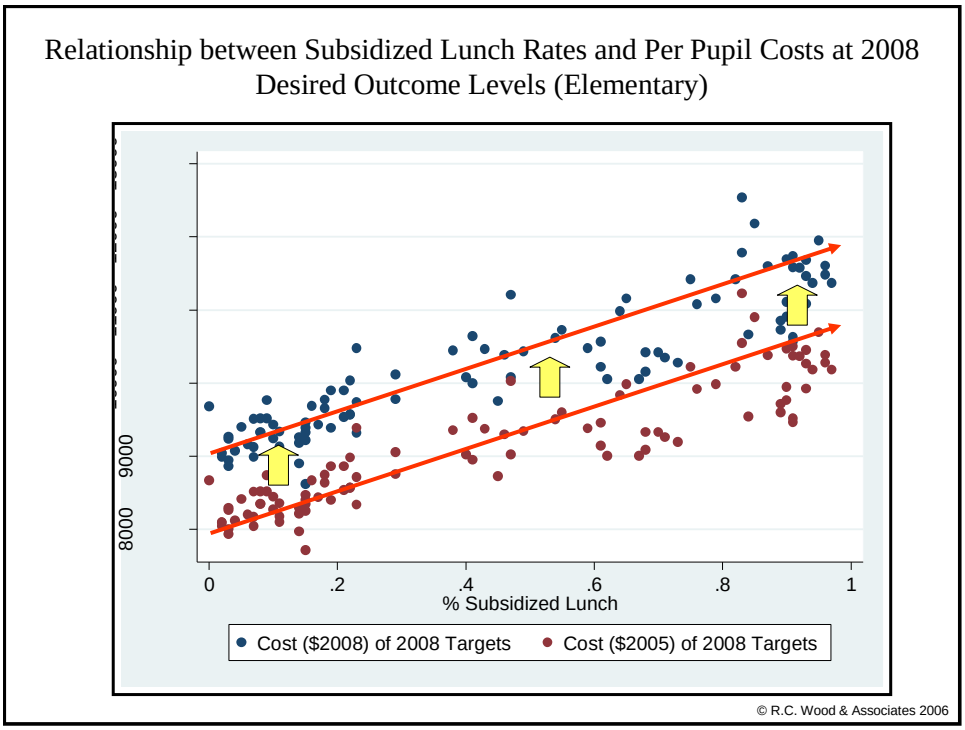
For each school in Rhode Island, we are able to generate a predicted relative cost per pupil and a predicted dollar cost per pupil of achieving desired outcome levels. The following figure addresses relative costs per pupil by school poverty rates, for elementary schools that are scale efficient. Schools are sorted along the horizontal axis by rates of children qualifying for subsidized lunch. For elementary schools with over 80 percent of children qualifying for subsidized lunch, per pupil costs are predicted to range from about average (1.0 on the vertical axis) to over 20 percent above average (over 1.2). For elementary schools with under 20 percent qualifying for subsidized lunch, per pupil costs are predicted to range from 15 percent below average to about average costs per pupil.

Intervening factors other than poverty rates exist, such as disability rates across schools. Clearly, however, there is a positive relationship between poverty rates and the costs associated with closing achievement gaps.

Relationship between Subsidized Lunch Rates and Cost Indices for Elementary Schools

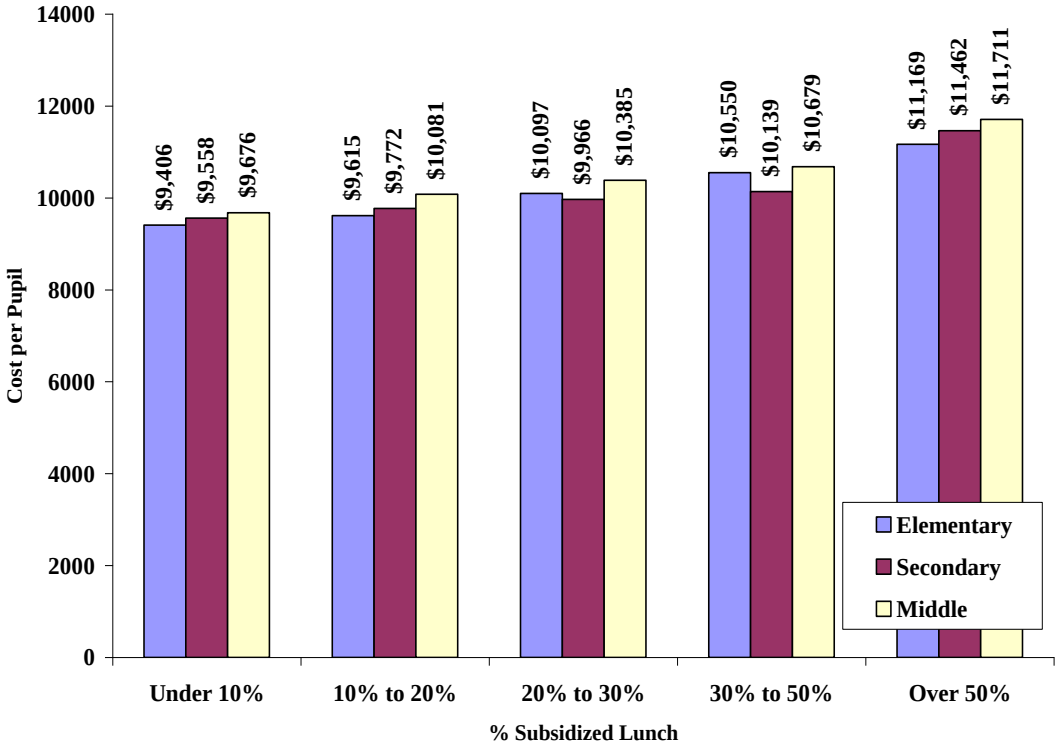
*year set to 2006, % Proficient set to average across years

The following figure puts elementary school per pupil costs into dollar terms, represent for 2008 outcome levels, with red dots representing costs per pupil in $2005 and blue dots representing inflation adjustment toward $2008. In 2008, in $2008, elementary costs per pupil are predicted to range from about $9,000 per pupil for low poverty elementary schools to about $12,000 per pupil in the highest poverty elementary schools.



The following figure presents a bar graph of the average per pupil costs of 2008 outcomes in $2005 for grade level categories and by poverty, but only up through those with over 50 percent poverty. We assign these particular groupings for later direct comparison with Successful Schools estimates, which were performed across these same categories (using 2005 expenditure data and 2008 outcome targets). The figure shows the slight differences in per pupil costs predicted by grade level and also shows the scaling upward of costs as poverty increases. Note, however, that all high poverty schools are clustered into one group of those schools with over 50 percent qualifying for subsidized lunch.

For comparison purposes one should note that Successful Schools analysis takes the average spending (with no correction for inefficiency) of schools *at or above* the 2008 proficiency targets. In the cost function model, we predict the required spending *at* (not above) the 2008 proficiency targets. That is, the averages for successful schools not only include those who are right *at* the performance thresholds, but many schools that are well above those thresholds, and potentially spending more to be at those levels. One would expect the cost function per pupil cost predictions to be somewhat lower, for at least these two reasons – lack of efficiency controls in Successful Schools, and spending levels of schools that not only meet, but exceed the target outcomes.



The cost function approach estimates that $42.4 million in additional funding is required to provide an adequate education in Rhode Island

Professional Judgment Approach

The process of bringing together expert educators (i.e. expert panels) to determine the required inputs for an adequate or quality education is known as the professional judgment methodology. This has been the most mostly widely used approach to determine adequacy and has been used in at least nineteen states.[22] The greatest strength of the approach is that expert educators who are intimately familiar with the needs of schools providing valuable insight as to the required personnel inputs for an adequate education. However, critics of the approach also see expert educators determining adequacy as the major limitation to the method. Specifically, critics argue that educators who will be receiving the services may be biased and overstate the requirements. Furthermore, critics argue that previous adequacy studies generally had far to few participants, resulting in an invalid sample. Specifically, should twenty-five educators determine the educational policy for an entire state? Finally, critics argue different group of educators may arrive at different results, and question the replicability of the approach.

The creation of prototype schools is the first step when undertaking a professional judgment analysis. These hypothetical prototype schools are based on state statistics. For Rhode Island, elementary, middle, and high schools were first ranked based on enrollment and split into three categories, small, medium, and large. Then the average enrollments within each subgroup was determined along with percentages of special need students, resulting in nine prototype schools: Small, medium, and large, elementary, middle and high schools. The following table provides details on the enrollment makeup of prototype schools.

Demographic Makeup of Prototype Schools

	Small		Medium		Large	
Elementary	Enrollment	197	Enrollment	308	Enrollment	469
	F&R	79 (40.1%)	F&R	73 (23.6%)	F&R	240 (51.1%)
	Sp. Ed.	40 (20.4%)	Sp. Ed.	55 (17.7%)	Sp. Ed.	86 (18.3%)
	ELL	16 (7.9%)	ELL	6 (2.0%)	ELL	52 (11.0%)
Middle	Enrollment	454	Enrollment	657	Enrollment	923
	F&R	123 (27.1%)	F&R	274 (41.8%)	F&R	361 (39.1%)
	Sp. Ed.	84 (18.4%)	Sp. Ed.	129 (19.6%)	Sp. Ed.	174 (18.9%)
	ELL	10 (2.2%)	ELL	32 (4.8%)	ELL	47 (5.1%)
High	Enrollment	266	Enrollment	891	Enrollment	891
	F&R	147 (55.2%)	F&R	211 (23.6%)	F&R	211 (23.6%)
	Sp. Ed.	48 (17.9%)	Sp. Ed.	127 (14.2%)	Sp. Ed.	127 (14.2%)
	ELL	16 (6.2%)	ELL	31 (3.4%)	ELL	31 (3.4%)

[22] Professional judgment studies have been undertaken in states such as: Oregon, South Carolina, Maryland, Kansas, Nebraska, Indiana, Colorado, Missouri, Kentucky, North Dakota, Washington, Montana, New York, Missouri, Nevada, New Jersey, South Dakota, and Alaska

As a means to overcome the limitation of having only a small group of individuals determining results, all building principals in Rhode Island were provided a survey with their corresponding prototype school, and asked to provide input on what they considered to be the required adequate inputs. Overall, 148 principals (46 percent) responded. The table below provides information on the respondent schools.

Comparison of Schools that Responded to Prototype Survey to Non-Respondents

	Avg. Enrollment			% Subsidized Lunch			Current Expend per Pupil		
Level	No	Yes	All	No	Yes	All	No	Yes	All
E	320	333	326	33%	44%	38%	$11,371	$12,034	$11,659
H	1012	866	934	23%	41%	33%	$11,890	$12,761	$12,354
M	699	667	686	31%	43%	36%	$11,607	$12,432	$11,944
All	480	484	482	31%	43%	37%	$11,482	$12,232	$11,817

No = non respondents
Yes = respondents

As the table shows, while the enrollment of respondent to non-respondent schools is similar, the responding school principals reflected a rate of 43 percent Free & Reduced Price Lunch students while non responding building principals reflected a 31 percent Free & Reduced Price Lunch student count within their schools. Responding building principals reported higher expenditures than non-responding building principals.

Along with overcoming the limitation of a small sample size inherent in other professional judgment panels, we also conducted two different school expert panels and a district panel, one of the school expert panels was held prior to administration of the survey and one after. The first school expert panel was invited by staff from the Joint Committee with input from various education entities in the state of Rhode Island, and all school district superintendents and their staff were invited for the district panel. For the second expert panel, principals from all "high performing" schools were invited to participate, along with recommendations from the Rhode Island Principals Association.

While information from surveys provided to all building principals in the state resulted in valuable information on required inputs, the research protocol averages the results of the two expert panels and thus provides the most valid information. Specifically, allowing educators to discuss the requirements with other educators in a collaborative manner and with a moderator helps overcome any questions or difficulties individual principals may have had with the survey.

Before turning to the results of the prototype schools, an overview on how we calculated input costs is provided.

Teacher Costs

Step One:

The first step to identifying teacher costs is to determine average teacher salaries. Based on statistics by the National Education Association, the average teacher salary in Rhode Island was $53,473 in 2004-05.[23] When inflated by 11.7 percent, the average teacher salary would be projected to be $59,729 for the 2007-08 school year.

Step Two: From discussions with teacher union representatives and other entities in the state, pension contributions were determined to be approximately 20 percent, which when applied to $59,729 equals $71,675.

Step Three: To calculate health care costs, we estimated that a family plan costs $14,000 and individual plans at $5,600 (40 percent of family plan). Then, we estimated that two-thirds of teachers would receive the family plan, and one-third the individual plan. The weighted average for health care costs would then be $11,200. We finally estimated that 90 percent of teacher would receive health care plans, bringing the average to $10,080. When this amount is applied to the average salary and pension cost, the result is $81,755. These projected estimates are based on discussions with National Education Association state and national representatives and based on the best data available at the time of this report.

Principal Costs

To estimate the costs for principals and vice-principals, data were obtained from the Rhode Island Schools Committee organization and inflated to project the 2007-08 school year. Then pension and health care costs were applied in the same manner as for teachers. The results were: $120,151 for elementary school principals; $129,890 for middle school principals; $110,616 for middle school assistant principals; $136,092 for high school principals; and $119,116 for high school assistant principals.

Teacher Aides

For teacher aides, expert panel members stated that a $25,000 salary would recruit the high quality aides required for adequate schools. In addition, they believed $5,600 in benefits per teacher would be required, bringing the total to $30,600 per teacher aide.

Substitutes

Expert panel members believed that for every ten teachers, one would be absent, requiring a substitute for every ten teachers and the cost of $85 dollars a day.

[23] http://www.nea.org/edstats/RankFull06b.htm

Office/Secretarial, Meal Preparation, and Custodians

Data from the U.S. Census provided information on average wages in Rhode Island for Office/Secretarial, Meal Preparation and Custodians. Based on our analysis and inflating to the 2007-08 school year, we applied the hourly rates of $19.75 for office/secretarial, $13.52 for food preparation, and $14.60 for custodians.

Other Costs

During our district panel meeting, participants were of the collective view that the best way to determine other costs associated with Instructional Supplies and Materials, Technology, Professional Development and security would be to provide summary results from their A-3 In$ite report and ask if increases on a per-pupil basis were required. Therefore, we sent A-3 summary reports to all superintendents and asked them to provide required increases, if any. Overall, fourteen of the thirty-six superintendents responded (38.9 percent). Summary results were then determined and applied to the prototype schools. These costs are provided on a per-pupil basis.

Results for Prototype Schools

The following pages provide tables with summary information g school types and sizes along with the required personnel inputs identified by the professional judgment expert panels.

Large Elementary Prototype Results

Total Students	469
Free & Reduced Students	240 (51.1%)
Special Education Students	86 (18.3%)
English Language Learners	52 (11.0%)
Classroom Teachers	23.75
Instructinal aides	5.50
Literacy or math specialists tot	6.00
PE	2.25
Arts/Music	2.50
Other Teachers	15.00
Technology Specialists	1.13
Librarians/Media Specialists	1.25
Pupil Support Staff	
- Guidance Counselors	1.25
- Nurses	1.00
- Psychologists	1.00
-Speech pathologists	0.75
-Occupational therapist	0.63
-Physical therapist	0.50
- Science Coach	1.00
Principal	1.00
Assistant Principal	1.00
Clerical/Data Entry	3.00
Substitutes	4.95
Cooks/meals	3.00
Custodian	3.00
Other Costs: per-pupil basis	
Instructional Materials & Supplies	$221
Technology	$220
Assessments	$45
Professional Development	$275
Security	$16
Student Activites	$50
Total Per-Pupil Costs	**$12,517**

The per-pupil result of the large elementary school prototype ($12,517) was 13.5 percent more than the actual expenditures ($11,168)

Medium Elementary Prototype Results

Total Students	308
Free & Reduced Students	73 (23.6%)
Special Education Students	55 (17.7%)
English Language Learners	6 (2.0%)
Classroom Teachers	16
Instructinal aides	12.5
Literacy or math specialists	3
PE	1.5
Arts/Music	1.625
Other Teachers	6.5
Librarians/Media Specialists	1
Technology Specialists	1
Pupil Support Staff	
- Guidance Counselors	1
- Nurses	1
- Psychologists	0.75
-Speech pathologists	1
-Occupational therapist	0.5
-Physical therapist	0.5
Social worker	0.8
Family service coordinator	1
Principal	1
Assistant Principal	0.5
Clerical/Data Entry	1.5
Substitutes	2.82
Cooks/meals	2
Custodian	2.5
Other Costs: per-pupil basis	
Instructional Materials & Supplies	$221
Technology	$220
Assessments	$45
Professional Development	$275
Security	$16
Student Activites	$50
Total Per-Pupil Costs	**$12,966**

The per-pupil result of the medium elementary school prototype ($12,966) was 16.0 percent more than the actual expenditures ($11,343)

Small Elementary Prototype Results

Total Students	197
Free & Reduced Students	79 (40.1%)
Special Education Students	40 (20.4%)
English Language Learners	16 (7.9%)
Classroom Teachers	12
Instructinal aides	8
Literacy or math specialists	2
PE	1.125
Arts/Music	1.125
Other Teachers	
special ed teacher	4
Librarians/Media Specialists	1
Technology Specialists	1
Pupil Support Staff	
- Guidance Counselors	1
- Nurses	1
- Psychologists	0.5
-Speech pathologists	0.8
-Occupational therapist	0.2
-Physical therapist	0.2
Family service coordinator	1
Social Worker	0.5
Principal	1
Assistant Principal	
Clerical/Data Entry	1
Substitutes	1.82
Cooks/meals	1.5
Custodian	2
Other Costs: per-pupil basis	
Instructional Materials & Supplies	$221
Technology	$220
Assessments	$45
Professional Development	$275
Security	$16
Student Activites	$50
Total Per-Pupil Costs	**$14,840**

The per-pupil result of the small elementary school prototype ($14,840) was 21.8 percent more than the actual expenditures ($11,343)

Large Middle School Prototype Results

Total Students	923
Free & Reduced Students	361 (39.1%)
Special Education Students	174 (18.9%)
English Language Learners	47 (5.1%)
Classroom Teachers	44.50
Instructinal aides	16.00
Literacy or math specialists	10.50
PE	7.00
Arts/Music	5.00
Other Teachers	
speical ed teachers	11.50
Librarians/Media Specialists	4.00
Technology Specialists	5.00
Pupil Support Staff	
- Guidance Counselors	5.00
- Nurses	1.75
- Psychologists	1.25
-Speech pathologists	1.25
-Occupational therapist	1.00
-Physical therapist	1.00
Principal	1.00
Assistant Principal	2.25
Clerical/Data Entry	6.00
Substitutes	7.30
Cooks/meals	6.00
Custodian	6.00
Other	
Social Worker	2.00
DPT	0.75
Student Assistance Counselor	1.50
Site based Coordinator	0.75
Other Costs: per-pupil basis	
Instructional Materials & Supplies	$221
Technology	$220
Assessments	$45
Professional Development	$275
Security	$16
Student Activites	$125
Total Per-Pupil Cost	**$11,706**

The per-pupil result of the large middle school prototype ($11,706) was 1.8 percent more than the actual expenditures ($11,523)

Medium Middle School Prototype Results

Total Students	657
Free & Reduced Students	274 (41.8%)
Special Education Students	129 (19.6%)
English Language Learners	32 (4.8%)
Classroom Teachers	31.5
Instructinal aides	12.75
Literacy or math specialists	7.5
PE/Health	6
Arts/Music	5.5
Other teachers	8
Librarians/Media Specialists	3
Technology Specialists	4.25
Pupil Support Staff	
- Guidance Counselors	4
- Nurses	1.25
- Psychologists	0.875
-Speech pathologists	0.75
-Occupational therapist	0.75
-Physical therapist	0.75
Principal	1
Assistant Principal	2
Clerical/Data Entry	5
Substitutes	4.05
Cooks/meals	3.5
Custodian	4
Social Worker	2
DPT	0.5
Student Assistance Counselor	1.5
Other Costs: per-pupil basis	
Instructional Materials & Supplies	$221
Technology	$220
Assessments	$45
Professional Development	$275
Security	$16
Student Activites	$125
Total Per-Pupil Costs	**$12,375**

The per-pupil result of the medium middle school prototype ($12,375) was 7.9 percent more than the actual expenditures ($11,559)

Small Middle School Prototype Results

Total Students	454
Free & Reduced Students	123 (27.1%)
Special Education Students	84 (18.4%)
English Language Learners	10 (2.2%)
Classroom Teachers	24.00
Instructinal aides	8.70
Literacy or math specialists	6.00
PE/Health	4.00
Arts/Music	4.00
Other Teachers	6.00
Librarians/Media Specialists	2.00
Technology Specialists	3.00
Pupil Support Staff	
- Guidance Counselors	2.50
- Nurses	1.00
- Psychologists	1.00
-Speech pathologists	0.50
-Occupational therapist	0.50
-Physical therapist	0.50
Principal	1.00
Assistant Principal	1.00
Clerical/Data Entry	4.00
Substitutes	3.80
Cooks/meals	2.50
Custodian	3.00
Other	
Social worker	1.00
curriculum coordinator	1.00
DPT	0.50
Student Assistance Counselor	1.00
Site Based Cordinator	0.50
Other Costs: per-pupil basis	
Instructional Materials & Supplies	$221
Technology	$220
Assessments	$45
Professional Development	$275
Security	$16
Student Activites	$125
Total Per-Pupil Costs	**$13,099**

The per-pupil result of the small middle school prototype ($13,099) was 4.0 percent more than the actual expenditures ($12,648)

Large High School Prototype Results

Total Students	1442
Free & Reduced Students	347 (24.1%)
Special Education Students	249 (17.2%)
English Language Learners	35 (2.4%)
Classroom Teachers	78
Instructinal aides	40
Literacy or math specialists	6
PE	8
Arts/Music	6.75
Other Teachers	22
Librarians/Media Specialists	5.00
Technology Specialists	5.50
Pupil Support Staff	
- Guidance Counselors	6.00
- Nurses	1.50
- Psychologists	1.5
-Speech pathologists	1.5
-Occupational therapist	1
-Physical therapist	1
Other -	
-Social Workers	1.5
-DPT Resource	1.50
-Student Assistance Counsel	1.50
-Site Based Coordinators	1.50
Principal	1
Assistant Principal	4
Clerical/Data Entry	10
Substitutes	10.22
Cooks/meals	7
Custodian	10
Other Costs: per-pupil basis	
Instuctional Supplies & Materia	$221
Technology	$220
Assessments	$45
Professional Development	$275
Security	$16
Student Activities	$200
Total per-pupil cost	**$11,380**

The per-pupil result of the large high school prototype ($11,380) was 2.7 percent more than the actual expenditures ($11,113)

Medium High School Prototype Results

Total Students	891
Free & Reduced Students	211 (23.6%)
Special Education Students	127 (14.2%)
English Language Learners	31 (3.4%)
Classroom Teachers	52.00
Instructinal aides	23.00
Literacy or math specialists	4.00
PE	4.50
Arts/Music	4.00
Other Teachers	14.50
Librarians/Media Specialists	3.50
Technology Specialists	3.00
Pupil Support Staff	
- Guidance Counselors	4.00
- Nurses	1.00
- Psychologists	1.00
-Speech pathologists	0.87
-Occupational therapist	0.75
-Physical therapist	0.75
-Social Workers	1.00
-DPT Resource	1.00
-Student Assistance Counsel	1.00
-Site Based Coordinators	1.00
Principal	1
Assistant Principal	2.5
Clerical/Data Entry	4.5
Substitutes	7.05
Cooks/meals	5
Custodian	7
Other Costs: per-pupil basis	
Instructional Materials & Supp	$221
Technology	$220
Assessments	$45
Professional Development	$275
Security	$16
Student Activities	$200
Total Per-Pupil Cost	**$11,877**

The per-pupil result of the medium high school prototype ($11,877) was 2.1 percent more than the actual expenditures ($11,657)

Small High School Prototype Results

Total Students	266
Free & Reduced Students	147 (55.2%)
Special Education Students	48 (17.9%)
English Language Learners	16 (6.2%)
Classroom Teachers	13.00
Instructinal aides	7.00
Literacy or math specialists	1.50
PE	2.00
Arts/Music	2.50
Other Teachers	6.00
Librarians/Media Specialists	1.00
Technology Specialists	1.00
Pupil Support Staff	0.00
- Guidance Counselors	1.00
- Nurses	0.50
- Psychologists	0.50
-Speech pathologists	0.50
-Occupational therapist	0.50
-Physical therapist	0.50
Other -	
-Social Workers	0.75
-DPT Resource	0.50
-Student Assistance Counse	0.75
-Site Based Coordinators	0.83
Principal	1.00
Assistant Principal	1.00
Clerical/Data Entry	3.00
Substitutes	2.75
Cooks/meals	2
Custodian	2
Other Costs: per-pupil basis	
Instructional Materials &	$221
Technology	$220
Assessments	$45
Professional Development	$275
Security	$16
Student Activites	$225
Total Per-Pupil Cost	**$13,931**

The per-pupil result of the small high school prototype ($13,931) was 17.9 percent more than the actual expenditures ($12,007).

For the system as a whole, the above increases would require and additional $153.5 million in funding, an 8.6 percent increase. However, panel members strongly suggested extra resources should be provided on additional assistance for students not meeting standards. Additional programs such as summer school, after school programs, and early morning programs were promoted. However, panel members believed that a block grant should be provided to districts and schools in order to allow for flexibility and innovation. Therefore, expert panel members determined that funding should be provided for 200 additional hours for "insufficient progress" (also know as 1's and 2's) students as classified by state assessments. The percent of "insufficient progress" students for the state as a whole should be applied to the total enrollment in the state to address those students who are in grades that are not required to take state assessments.

The methodology to identify the costs associated for these additional hours is provided.

Calculation for Additional Programs Under the Professional Judgment Approach

Step One:

Identification of percent of students in the state classified as "Insufficient Progress". From discussions with Department of Education personnel, it is estimated that 45 percent of students in the state are classified as "Insufficient Progress" students.

Step Two:

Based on the RIDE estimate, we multiplied the total number of students in the state by 45 percent. Thus, 154,045 times 45 percent equaled 65,270.

Step Three:

We multiply 65,270 by 200 hours, (the professional judgment panel recommended 200 hours of instruction) they recommended, which equaled 13,054,050 total hours.

Step Four: We divided the total hours by 10; this represented the student to teacher ratio the expert panels believed was required for these additional educational opportunities. Thus, 13,054,050 divided by 10 equaled 1,305,405 teacher hours.

Step Five: We multiplied the total number of teacher hours by the average state teacher salary. Thus, 1,305,405 was multiplied by $39.30, which equaled $ 51.3 million.

Summary, Professional Judgment Models

School Classification	Percentage Increase Recommended	School Prototype Recommendation	Actual School Expenditure
Large Elem. Sch.	+13.5%	$12,517	$11,168
Med. Elem Sch.	+16.0%	$12,996	$11,343
Small Elem. Sch.	+21.8%	$12,840	$11.343
Large Middle Sch.	+1.8%	$11,706	$11,523
Med. Middle Sch.	+7.9%	$12,375	$11.559
Small Middle Sch.	+4.0%	$13,099	$12,648
Large High Sch.	+2.7%	$11,380	$11,113
Medium High Sch.	+2.1%	$11.877	$11,657
Small High Sch.	+17.9%	$13,931	$12,007

These data thus accounts for an increase of:

8.7 percent of per pupil expenditures
This equals an increase of $ 153.5 Million.

Additionally, Insufficient Progress students would account for an increase of:

$ 51.3 Million.

When these two judgments are combined the total required increased in education funding identified by the professional judgment approach equaled a projected $204.8 million.

Evidence Based Methodology

The Evidenced Based methodology is built on the approach of what educational strategies and concepts appear to be most successful in improving achievement in the public elementary and secondary schools. The approach is essentially an identification of strategies in the research literature as to the organizational and delivery variables that improve student performance. It must be clearly stated that such literature varies greatly as to its generalizability and its level of rigor and research protocols utilized. Further, in many instances much of the research literature is heavily based on case studies, limited generalizability, and small numbers of subjects. However, several recently released studies have had random assignment of groups and the random application of treatment to the groups and others have met specific "matching" research standards and can be seen as some of the strongest evidence yet as to effective programs and practices. The following tables provide information on effective programs and practices for a variety of educational areas.

Before turning to overviews on the effectiveness of different programs and practices, it is important to provide an explanation on "Effect Sizes." The positive or negative effect size in research estimates how much improvement can be expected with the implementation of the strategy. Specifically, the effective size determines how far the strategy would move students from the 50th percentile. For example, a positive effect size of .25 would move students from the 50th to 60th percentile on an assessment. The following table provides additional information on effect sizes.

Effect Size	New Position in distribution (percentile)
0	50th
0.25	60th
0.5	69th
1	84th
1.5	93th
2	98th

Effective Strategies for Elementary Math

Small Group Tutoring
Research has shown that three times a week, plus 10 minutes of work on computers to build math facts skills to be an effective educational strategy, with a positive effect size of .37.[24]

Team Assisted Individualization
TAI is designed for grades 3-6, students work in 4-5 member, heterogeneous teams. They are initially tested and placed in an instructional sequence according to their current levels of performance. Teachers introduce concepts in groups of students drawn from the teams who are at the same performance level. Students then work through individualized materials with the help of their teammates, preparing for individualized assessments. Teams receive certificates and recognition based on the progress made by all members in passing these assessments.[25] The average effect size based on several research studies was .16.[26]

Peer-Assisted Learning Strategies
Student work in pairs to learn mathematical concepts with each other. Children alternate every 15 minutes as tutor and tutee, using specific strategies for correction procedures. The strategy is used as a supplement to traditional textbook-based instruction approximately 30 minutes a day, three times a week. The average effect size for this strategy was .26.[27]

Student Teams-Achievement Divisions
Students work in small teams to help each other master mathematics content. Team scores were based on the sum of students' individual test scores, and the highest-scoring teams received small rewards. The average effect size for this strategy was .30.[28]

Classworks
Classworks, from Curriculum Advantage, is a comprehensive computer learning system. It contains over 1,000 units of instruction, drawn from over 100 software titles. *Classworks* provides comprehensive curriculum materials, as well as the tools that let

[24] Fuchs, L., Compton, D., Fuchs, D., Paulsen, K., Bryant, J., & Hamlett, C. (2005). The Intervention, Identification, and Cognitive Determinants of Math Difficulty. *Journal of Educational Psychology, 97* (3), 493-513
[25] Slavin, R., Leavey, M., & Madden, N.A. (1984). Combining Cooperative Learning and Individualized Instruction: Effects on Student Mathematics Achievement, Attitudes, and Behaviors. *The Elementary School Journal, 84* (4), 409-422.
[26] Slavin, R., Lale. C. (2007). Effective Programs in Elementary Math: An Evidence-Based Synthesis. Institute of Education Sciences, U.S. Department of Education (Grant No. R305A040082). Available on the World Wide Web at http://www.bestevidence.org/math/math_summary.htm
[27] Slavin, R., Lale. C. (2007). Effective Programs in Elementary Math: An Evidence-Based Synthesis. Institute of Education Sciences, U.S. Department of Education (Grant No. R305A040082).
[28] Slavin, R., Lale. C. (2007). Effective Programs in Elementary Math: An Evidence-Based Synthesis. Institute of Education Sciences, U.S. Department of Education (Grant No. R305A040082).

teachers and administrators manage, assess, and individualize their students' learning process. The average effect size for this strategy was .53.[29]

Cognitively Guided Instruction
Education strategy that uses extensive professional development to prepare elementary teachers to teach mathematics for understanding by building on the intuitive knowledge of mathematics and problem solving strategies that children bring to instruction. The average effect size for this strategy was .24.[30]

Connecting Math Concepts
Math curriculum that has six guiding principles of effective instruction: 1) key concepts, "big ideas", are taught that have broad applicability; 2) prerequisite skills are introduced before complex learning; 3) explicit instruction, with specific strategies and rules, is used to teach concepts, 4) guided practice is given to the students in the beginning stages of learning and phased out as students become more competent; 5) each new strategy is woven with other strategies in order to clearly connect different aspects of knowledge; and 6) cumulative review is provided. Teachers follow a detailed manual that gives them specific wording and error correction procedures to use in all lessons. The average effect size for this strategy was .63.[31]

Consistency Management & Cooperative Discipline
Preventive approach to classroom management that emphasizes shared student and teacher responsibility for learning. It trains teachers in strategies for engaging students in setting and adhering to classroom rules, giving students helping roles within the classroom (such as taking attendance and passing out papers), involving parents, and using strategies for calling on students that ensure that all will have opportunities to respond. The average effect size for this strategy was .43.[32]

Project SEED
Supplementary mathematics program where university mathematicians and scientists teach elementary students high-level mathematics concepts. The intention of the program is both to help students develop their math skills and to motivate them to continue their education in mathematics into middle and high school. The instruction focuses on questions to students designed to get them to think creatively and productively in mathematics. The average effect size for this strategy was .64.[33]

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[29] Slavin, R., Lale. C. (2007). Effective Programs in Elementary Math: An Evidence-Based Synthesis. Institute of Education Sciences, U.S. Department of Education (Grant No. R305A040082).
[30] Slavin, R., Lale. C. (2007). Effective Programs in Elementary Math: An Evidence-Based Synthesis. Institute of Education Sciences, U.S. Department of Education (Grant No. R305A040082).
[31] Slavin, R., Lale. C. (2007). Effective Programs in Elementary Math: An Evidence-Based Synthesis. Institute of Education Sciences, U.S. Department of Education (Grant No. R305A040082).
[32] Slavin, R., Lale. C. (2007). Effective Programs in Elementary Math: An Evidence-Based Synthesis. Institute of Education Sciences, U.S. Department of Education (Grant No. R305A040082).
[33] Slavin, R., Lale. C. (2007). Effective Programs in Elementary Math: An Evidence-Based Synthesis. Institute of Education Sciences, U.S. Department of Education (Grant No. R305A040082).

Effective Strategies for Middle School Math

The Connected Mathematics Project (CMP)
Problem-centered mathematics curriculum designed for all students in grades 6–8. Each grade level of the curriculum is a full-year program and covers numbers, algebra, geometry/measurement, probability, and statistics. The program seeks to make connections within mathematics, between mathematics and other subject areas, and to the real world. The curriculum is divided into a sequenced set of units, each organized around different mathematical topics. The four to seven lessons in a unit each contain one to five problems that the teacher and students explore in class. Additional problem sets, called Applications, Connections, and Extensions, in each lesson help students practice, apply, connect, and extend their understanding and skills. Each lesson culminates in a Mathematical Reflections activity. According to the developers, the *CMP* addresses National Council of Teachers of Mathematics standards. The average percentile point increase for this strategy (not effect size) was 4.[34]

The Expert Mathematician

Designed to help middle school students develop the thinking processes for mathematical applications and communication. A three-year program of instruction, *The Expert Mathematician* uses a software and consumable print materials package with 196 lessons that teach the *Logo* programming language. Each lesson ranges from 40–120 minutes, or one to three class periods. *The Expert Mathematician* coursework combines integrated computer software with workbook activities. A test of unit concepts is administered at the end of each instructional unit. The developer used the computer program *LogoWriter* to develop the curriculum, which covers general mathematics, pre-algebra, and algebra I. The developer describes the curriculum as covering the range of concepts and content areas in the National Council of Teachers of Mathematics *Curriculum and Evaluation Standards*. This strategy resulted in a 12-point percentile assessment increase.[35]

Early Reading

DaisyQuest

This is a software bundle that offers computer-assisted instruction in phonological awareness, targeting children aged three to seven years. The instructional activities, framed in a fairy tale involving a search for a friendly dragon named Daisy, teach children how to recognize words that rhyme; words that have the same beginning, middle, and ending sounds; and words that can be formed from a series of phonemes

[34] US Department of Education: What Works Clearing House. Intervention Report. Accessible from the Word Wide Web at http://www.whatworks.ed.gov/InterventionReportLinks.asp?iid=20&tid=03
[35] US Department of Education: What Works Clearing House. Intervention Report. Accessible from the Word Wide Web at http://www.whatworks.ed.gov/InterventionReportLinks.asp?iid=35&tid=03

presented separately, as well as how to count the number of sounds in words. This strategy resulted in a 23-point percentile assessment increase.[36]

English Language Learners

The Bilingual Cooperative Integrated Reading and Composition (BCIRC)
An adaptation of the *Cooperative Integrated Reading and Composition (CIRC)* program was designed to help Spanish-speaking students succeed in reading Spanish and then making a successful transition to English reading. I n the adaptation, students complete tasks that focus on reading, writing, and language activities in Spanish and English, while working in small cooperative learning groups. The intervention focuses on students in grades 2–5. This strategy resulted in a 17-point percentile assessment increase.[37]

Enhanced Proactive Reading
Comprehensive, integrated reading, language arts, and English language development curriculum, is targeted to first-grade English language learners experiencing problems with learning to read through conventional instruction. The curriculum is implemented as small group daily reading instruction, during which English Language Learners instructors provide opportunities for participation from all students and give feedback for student responses. This strategy resulted in a 19-point percentile assessment increase.[38]

Fast ForWord Language
Computer-based instructional program developed to build cognitive skills students need to improve English language proficiency and reading skill. It consists of seven game-like exercises, including nonverbal and verbal sound discrimination, phonological processing, vocabulary recognition, and language comprehension. Each exercise begins with basic skills and builds up to more complex skills. The difficulty of each task is continuously adapted so that students would get about 80 percent of the items correct. This strategy resulted in a 17-point percentile assessment increase.[39]

Instructional Conversations and Literature Logs
Strategy to help English language learners develop reading comprehension ability along with English language proficiency. *Instructional Conversations* are small-group discussions. Acting as facilitators, teachers engage English language learners in discussions about stories, key concepts, and related personal experiences, which allow them to appreciate and build on each other's experiences, knowledge, and understanding. *Literature Logs* require English language learners to write in a log in response to writing

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[36] US Department of Education: What Works Clearing House. Intervention Report. Accessible from the Word Wide Web at http://www.whatworks.ed.gov/InterventionReportLinks.asp?iid=211&tid=01
[37] US Department of Education: What Works Clearing House. Intervention Report. Accessible from the Word Wide Web at http://www.whatworks.ed.gov/Intervention.asp?iid=21&tid=10&ReturnPage=InterventionAll.asp
[38] US Department of Education: What Works Clearing House. Intervention Report. Accessible from the Word Wide Web at http://www.whatworks.ed.gov/Intervention.asp?iid=256&tid=10&ReturnPage=InterventionAll.asp
[39] US Department of Education: What Works Clearing House. Intervention Report. Accessible from the Word Wide Web at http://www.whatworks.ed.gov/InterventionReportLinks.asp?iid=243&tid=10

prompts or questions related to sections of stories. These responses are then shared in small groups or with a partner. This strategy resulted in a 29-point percentile assessment increase.[40]

Read Well
This is a research-based reading curriculum designed to improve student literacy. This program includes explicit, systematic instruction in English decoding, sustained practice of decoding skills and fluency, and instruction in vocabulary and concepts presented in text. It also provides support for English language learner (ELL) students through scaffolded lesson instruction and oral language priming activities. This strategy resulted in a 10-point percentile assessment increase.[41]

Drop Out Prevention

Career Academies
This is a school-within-school programs operating in high schools. They offer career-related curricula based on a career theme, academic coursework, and work experience through partnerships with local employers. This strategy resulted in a 13-point percentile increase.[42]

Check & Connect
This is a dropout prevention strategy that relies on close monitoring of school performance, mentoring, case management, and other supports. The program has two main components: "Check" and "Connect." The Check component is designed to continually assess student engagement through close monitoring of student performance and progress indicators. The Connect component involves program staff giving individualized attention to students, in partnership with school personnel, family members, and community service providers. Students enrolled in *Check & Connect* are assigned a "monitor" who regularly reviews their performance (in particular, whether students are having attendance, behavior, or academic problems) and intervenes when problems are identified. The monitor also advocates for students, coordinates services, provides ongoing feedback and encouragement, and emphasizes the importance of staying in school. This strategy resulted in a 25-point percentile increase.[43]

Research Team Observations and Conclusions
Study team members spend considerable time contacting researchers and others to identify the costs associate with these programs, but unfortunately such information was

[40] US Department of Education: What Works Clearing House. Intervention Report. Accessible from the Word Wide Web at http://www.whatworks.ed.gov/InterventionReportLinks.asp?iid=243&tid=10
[41] US Department of Education: What Works Clearing House. Intervention Report. Accessible from the Word Wide Web at http://www.whatworks.ed.gov/InterventionReportLinks.asp?iid=324&tid=10
[42] US Department of Education: What Works Clearing House. Intervention Report. Accessible from the Word Wide Web at http://www.whatworks.ed.gov/InterventionReportLinks.asp?iid=321&tid=06
[43] US Department of Education: What Works Clearing House. Intervention Report. Accessible from the Word Wide Web at http://www.whatworks.ed.gov/Intervention.asp?iid=312&tid=06&ReturnPage=InterventionAll.asp

lacking. Again it must be noted, that clearing houses such as the U.S. Department of Education's What Work Clearing House have only in the past three years identified strategies that meet stringent program evaluation guidelines, and corresponding information on the valid costs of such approaches is severely limited. Many individuals stated that states agencies should look at adequacy studies to identify costs, creating a circular logic.

Since we originally responded to the request for proposal last May, well-respected experts in the field of education finance have cited significant validity problems with the evidence-based approach. Specifically, critics of the approach note that much of the research upon which evidence is determined is highly selective and does not accurately represent the research as a whole on particular issues.[44] Furthermore, critics note that the original whole school reforms upon which they originally recommended policies have shown mixed results by independent evaluators.[45] It must be noted that these critiques come from experts considered "liberal" and "conservative". Another critique of the approach notes that estimated positive effects are significantly overestimated. For example, the supposed effect size of all strategies would be between 3.1 and 5.8, suggesting that all students would move above the 99th percentile. Given these significant limitations over the approach that have been highlighted over the last year, we believe it is inappropriate and invalid to estimate costs using this approach. However, we do believe that additional funding should be provided by the state to establish pilot programs for a number of areas along with the creation of a strong program evaluation entity to measure results. Furthermore, given the strong research that does show the benefits of full-day kindergarten, we are of the professional opinion (as this was confirmed by the expert panels in the professional judgment approach) the state should provide additional funding for full-day kindergarten. Based on Department of Education data, 4,275 students are in full-day kindergarten programs, and 4,670 are not. In order to provide full-day kindergarten to all students, an additional $23,350,000 would be required. The calculation for this result is as follows:

4,670 times .5 (for additional ½ day) = 2,335, that is then multiplied by $10,000, a base cost that falls within the range of our other approach.

As previously discussed, we recommend pilot programs for:

Small group tutoring
Enhanced Technology usage
Drop Out Prevention and Career Prep
Early Grade Literacy and Math
Education of English Language Learners

[44] Hanushek, E. Is the 'Evidence-Based Approach" a Good Guide to Finance Policy? Policy Paper that can be accessed at http://www.hanushek.net.

[45] Duncombe, W. Responding to the Charge of Alchemy: Strategies for Evaluating the Reliability and Validity of Costing-Out Research. Paper Presented at the O'Leary Symposium, Chicago, IL, February 17th, 2006. Available on the web at: http://www-cpr.maxwell.syr.edu/efap/Publications/Responding_to_the_Charge.pdf

These areas are selected due to the fact that evidence-based strategies that have met rigorous evaluation standards (many of which were previously outlined) have been established. We recommend $25 million for these pilot programs. Furthermore, we suggest a $10 investment into a state of the art program evaluation entity that can begin to use the recently available school level finance data and new assessment information. Building an appropriate infrastructure to identify what works in Rhode Island is essential to improving elementary and secondary education in Rhode Island.

Recommended Totals

Full Day Kindergarten:	$23.35 million
Pilot Programs:	$25 million
Program Evaluation Infrastructure:	$10 million
Total:	$53.35 million

Trends in Career and Technical Education

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> *A CTE program of study is defined as a multi-year sequence of courses that integrate core academic knowledge with technical and occupational knowledge leading to higher levels of skill attainment over time with a unifying theme around which to organize the curriculum. A program of study by design provides students with a pathway to postsecondary education and a career by detailing academic and occupational competencies needed for advancement and providing a series of related courses (Brand, 2003, p. 6).*

Smith-Hughes Era:

Career and Technical Education (CTE) has a rich history in American education made possible by federal legislation and federal funding. The first federal vocational education bill was passed ninety years ago. This legislation, the Smith-Hughes Act of 1917, was designed to prepare students for work in agricultural and trades of industry after they graduated from high school; and to train teachers of vocational subjects. Vocational Education teachers' preparation mirrored that of their students; they were not spared the focused nature of trade education of that time. Beidel (1993) noted:

> The aim of instructor training was to provide professional knowledge and experience to those who already were masters of an occupation, trade, or subject which they were to teach. General education was also included in this training, but carefully monitored to use only material to be directly reflecting and of actual value to new or prospective teachers. These individuals were accustomed to thinking in concrete rather than abstract terms and the training should pertain to their most immediate needs (p. 6).

The vocational training programs of that era were designed to respond to the explicit needs of one specific labor force, whose requirements were identified by local industry. The universal model of vocational education during that time was created to direct less-academically inclined students to be trained in one trade for which their talents were deemed best suited. The Smith-Hughes Act of 1917 was largely responsible for the separation of Vocational Education from general education because it emphasized skill development over academics. However, the Smith-Hughes Act also contributed to Vocational Education's isolation from the comprehensive high school in other ways too. Most comprehensive high schools attempted to maintain some appearance of cohesion despite having two programs under one roof. The practical and theoretical were deemed essential to the daily operations of the "unified school". But, who had ownership of the program? States that accepted funding had to establish a State Board of Vocational Education that administered Smith-Hughes funds; this was a separate entity from the state's board of education. Vocational program directors reported to these boards about program expenditures and progress. There, in the same school, were two equal

administrators, principal and director, overseeing two very different and separate programs and student populations.

A number of vocational education initiatives were funded from 1942 through the 1960s, for which all funding was essentially used to initiate new programs and disseminate vocational education resources and research. In the 1960s, the most notable effort was the United States Department of Education's foray into educational research. They funded 21 R&D centers and 20 regional labs to work in schools around the United States. The most important development to come from this investment was the Educational Resources Information Center, known as ERIC. Among the initiatives of the Vocational Education Act of 1963 was the expansion of programs that included work/study opportunities for vocational students. This was an historic time for Vocational Education; new facilities were planned and built, equipment was purchased, and facilities were renovated with federal money.

Perkins Era:

In 1984, the Vocational Education Act of 1963 was renamed the Carl D. Perkins Vocational and Technical Education Act. This legislation provided "set aside" funding for special populations in order for them to participate fully in Vocational Education programs. Special populations included individuals with disabilities; individuals from economically disadvantaged families, including foster children; individuals preparing for nontraditional training and employment; single parents, including single pregnant women; displaced homemakers; and individuals with other barriers to educational achievement, including individuals with limited English proficiency.

The Perkins funding also provided the first steps to educational accountability by making vocational preparatory instruction available to underachievers and those lacking basic skills. Students were encouraged to enroll in certificate programs as a means of determining their level of academic skill. Candidates were often administered an entry-level exam within a few weeks of admission into the CTE program. Students who failed to achieve the basic skills required for their program were referred for vocational/academic remediation that featured a formal program of basic skills development. Students were required to meet the basic skills requirement in order to receive their vocational program certificate. Certification testing was used to determine worker capability too. Not only did certificate programs expand, but also the certification test became a necessary function for filling positions with high skilled workers. High technology industries identified the lack of available high skilled workers as a barrier to the growth of a company.

Tech-Prep programs were an outgrowth of the 1984 Act. These programs featured structured partnerships and articulation agreements between secondary high school programs and post-secondary institutions. The academic classes that vocational students took were enriched with rigor and challenging content. Generally, the Tech-Prep curriculum provided two years of technical/academic work in the high school, followed by a two-year program of study (2 + 2) in post-secondary Vocational Education. Parnell

(1985) was first and foremost in identifying the lack of attention most educators paid to the preparation of students for their journey from school to productive lives in the world of work. As a result of this problem, Parnell suggested that schools eliminate the general education sequence in high school programs because it was unsuitable for the task of preparing students for the transition. The solution he offered was to replace general education with Tech-Prep, which in his opinion was a far more appropriate educational experience for all concerned.

Despite the successes that Tech Prep purported to have achieved, there was still grave concern that the non-college bound students received little guidance in their transition from school to work. Several concrete conclusions were made about this group of students, and they were alarming. Non-college bound students often graduated with fewer marketable skills; faced prolonged unemployment; and often fell into despair. Although their options were limited once they left school, a number of recommendations were considered to remedy the problem. First, non-college bound students needed more guidance while in school. CTE programs could offer the required skill training and provide occupational guidance too. Mentoring programs and internships supervised by business volunteers were made available so that students could explore a number of occupations without risk. Many of the social skills students were missing were integrated into community programs that became a fixture in assisting non-college bound students with career development. In this supportive environment, students would acquire the personal skills and attitudes that were required to work in a meaningful career.

Since the 1990s, CTE has forged a new direction for students who participate in these programs. The purpose of the 1998 Perkins Act was as follows:

> …. is to develop more fully the academic, vocational, and technical skills of secondary students and postsecondary students who elect to enroll in vocational and technical
> education programs, by—
>
> (1) building on the efforts of States and localities to develop challenging academic standards;
> (2) promoting the development of services and activities that integrate academic, vocational, and technical instruction, and that link secondary and postsecondary education for participating vocational and technical education students;
> (3) increasing State and local flexibility in providing services and activities designed to develop, implement, and improve vocational and technical education, including tech-prep education;
> and;
> (4) disseminating national research, and providing professional development and technical assistance, that will improve vocational and technical education programs, services, and activities. (105th Congress, 1998, 112 STAT. 3077)

CTE students followed a curriculum that attempted to show them the global nature of an

industry, rather than concentrating on one set of specific job skills. Another change in CTE that was rather interesting was that programs began to ramp up efforts to prepare students for two tracks: employment and continuation of their studies in post secondary institutions. This new emphasis on integrating academic skills and occupational training broadened the appeal of CTE programs to students who might not have followed this path.

Perkins Career and Technical Education Improvement Act:

In the summer of 2006, the U.S. Congress passed an updated version of the Carl D. Perkins Vocational Improvement Act. The latest revisions require more rigorous programs, and indicators that demonstrate results of academic achievement. The most notable provisions of the Carl D. Perkins Career and Technical Education Improvement Act of 2006 is that it uses the term "*Career and Technical Education*" instead of "*Vocational Education*" throughout, maintains the Tech Prep program as a separate federal funding stream within the legislation, and maintains state administrative funding at 5 percent of a state's allocation. The re-authorization legislation preserves the program through FY 2012, for a total of six years. Other major changes include a new section on local accountability, the separation of performance indicators for secondary and postsecondary programs, and requirements for Career and Technical Programs of Study. States use their funds to provide career and technical programs that will give students technical and academic training that emphasizes problem-solving, creative thinking, effective communication and listening skills, teamwork, and knowing how to learn. In his press release from June 2006, the bill sponsor, U.S. Senator from Wyoming Mike Enzi, stated, "This bill will help support lifelong learning opportunities for students to gain technical skills and knowledge that will help them find and hold a high skill, high wage job," he also noted, "For others, participation in these programs can mean the difference between a job with no possibility of advancement and a successful career" (Enzi, 2006). Individuals who require training or who are seeking new profession options are offered education and training programs *throughout their lifetimes* to develop knowledge and skills that will keep them productive and fulfilled in a meaningful occupation.

The re-authorization of the Perkins Act has led to a numerous changes in the philosophy and subjects that are taught in Career and Technical Education. CTE is working very hard to create a new vision for the high school curriculum. Alarmed by the decrease of students entering and completing technical education programs, largely due to parental influences, practitioners and advocates for CTE, laid out a bold plan of action to integrate occupational training with academics. The result of this action is that CTE programs have become increasingly more rigorous and challenging because they have adopted and maintained academic content standards and provide career-based pathways leading to an industry-recognized credentials and certificates, or an associate or baccalaureate degree. It has been estimated that over 15 million high school students and college students take CTE courses. That figure reveals a 60 percent increase in student enrollment in CTE courses since 1999 (e-school News, 2006). The direction that CTE programs have charted is reflected in the recent reauthorization of the Perkins Act that requires that grant participants provide a broad base of academic skills, not just technical skills. The quality

of a CTE student's technical and academic training can help them develop knowledge beyond the occupational skills taught to them. Although training in CTE was largely intended for occupational preparation, it has instilled in its students the motivation to develop a more wide-ranging view of the profession that they are preparing for, and a host of academic skills necessary to enter post-secondary education programs.

Beginning in the 1990s, CTE programs began to address a "novel" approach to the teaching and learning process in occupational training. While specific job skill development was paramount, the contexts of an occupation were slowly being addressed in class. Today, teaching contextually has become the underpinning of most programs. As the career options for CTE students increase, and as traditional trade offerings become more technically sophisticated, greater expectations will be placed on the education system to produce students who demonstrate mastery of both technical and academic skills. Students will participate in CTE curricula that provide opportunities to explore all aspects of rapid technological development within an industry, rather than training in one specific job skill. One strategy adopted by CTE practitioners is to improve students' technological literacy. Bottoms (2005) stated:

> …quality CTE curricula must provide students with technical literacy that helps them communicate and work in their chosen field, but should also include mathematics reasoning and technical skill development that is broad. In his view, CTE must teach not only to a set of high academic standards but also to a high level of technical literacy that gives students an edge in the labor market *and* qualifies them for further schooling. (p. 35)

This trait can be overtly developed with the infusion of course work that addresses the scientific, mathematical, technological, social, economic, and environmental impacts that career training and work have on the way we live. Career and Technical Education courses that require technological proficiency and technological literacy will lead students to a broader and richer comprehension of the role that technology and work play in creating a citizenry that can function in a democratic society.

Career and Technical Education programs are being redesigned to incorporate active relationships between high school, business, and higher education for the sake of ensuring that graduates select and participate in high paying careers. In order to accomplish this, CTE programs must identify with high growth industries that will allow students to engage in projects that foster innovation and productivity. The relationships developed over time will increase students' engagement in real world scenarios and further develop complementary working skills that can be adapted to the changing nature of the workplace and the global economy. Contemporary programs have made efforts to integrate math, science, and literacy skills into routine course instruction, thus meeting the needs of CTE students.

It is expected that the combination of new philosophies, teaching methods, and content will affect positive change in CTE students' lives. Learning in the "New Economy" will require support, preparation, and guidance through a program that provides learners with

a set of abilities that range across the academic and technical divide. Schools must inform students about the curriculum they need to prepare for a fulfilling career or post-secondary education. CTE programs would be wise to adapt a culture of college preparation for everyone. If *all* students are expected to achieve high academic standards, then it stands to reason that the course work students take should be rigorous and contain all the elements necessary for college preparation. Bedsworth, et. al. (2006) made the case for academic rigor as the standard for academic preparation for success in college and a career. They stated, "The academic intensity of the curriculum a students takes in high school counts more than grades and test scores" (p. 4). They acknowledged that recent research on ACT revealed that a college preparatory curriculum is,

> …the same curriculum that will prepare students for a successful working life, even if they decide not to attend college…. To offer any other curriculum less than this not only fails the objective of college preparation, but also fails to prepare them for life and work (p. 19).

Math Strategies:

A math program within CTE, based on contextual problem-solving allows students to be cognizant of the importance of mathematics in the real world. Pilot studies indicated that high school students who participated in math-enriched CTE classes performed better than their counterparts on standardized tests and college placement exams (ACTE on-line, 2005). The success of students in math can be attributed to the use of teacher teams, math and CTE, who studied content and then embedded math into the coursework. Teachers adopted strategies to take abstract math concepts and place them in an occupational context. Students were taught the math in this relevant manner, and once they demonstrated understanding and proficiency, they were re-introduced to the concept in its more abstract form. The researchers at the National Research Center for Career and Technical Education (NRCCTE) have concluded that teaching math through applied learning allows students to grasp concepts quicker and makes understanding math easier. The implications for this work are good outcomes in core academic areas, and improvement of knowledge in core academic areas. However, CTE educators are not trained in mathematics; yet, according to Perkins (Section 113, item 2Ai) a measure of student academic performance in CTE is student attainment of challenging state established academic proficiencies. This change in process requires CTE teachers to work in partnership with their mathematics colleagues. Together, they can tailor lessons that create math proficiency and provide insight for mathematical concepts as they occur in occupations. NRCCTE found that the use of applied learning strategies is a successful means for making mathematics relevant and meaningful. A surprising outcome of this work was that math teachers who presented math in this way were eager to use it in their own classrooms because it provided a new and interesting way to teach math subjects.

Science Strategies:

Knowledge of science and technology is important for success in the workplace and post-secondary education. High school science course work was once used to determine

whether a student began occupational exploration in CTE or entered a college preparation track. However, the separation of the tracks is no longer valid because all students will be taught to achieve high academic standards. Science is one of the core subjects that all students need if they are to enjoy a rewarding career. CTE teachers will be charged to make science "practical" and "applied" within their courses. The American Association for the Advancement of Science, advocates that scientific literacy is an important factor in educating students to use scientific skills and knowledge so they can solve problems and increase their economic productivity. CTE programs have a number of particularly useful characteristics that make the teaching of science concepts less abstract. Reform in CTE has replaced the traditional "drill and grill" with methods of learning that include problem-solving, inquiry lessons, and hands-on activities; all are well suited to help students find practical applications for science they have learned. In the CTE labs, students can apply scientific method to personally relevant scenarios developed by a creative team of science teachers and CTE instructors. CTE and other technical studies can provide the perfect vehicle for using scientific applications in real world contexts, due to their relationship with work and industry. The community where students live and learn can also provide opportunities for scientific knowledge to real problems. Together, teachers and students search for problems that arise at work or in the community. As they work with their teachers to discover solutions to their problem, students apply the scientific and technical knowledge that they learned in class. Teachers provide practical scientific and technical concepts that might be applied to the problem's solution. The ultimate learning experience includes the student working in close collaboration with CTE instructors, science teachers, and members of their community to solve a local problem. With this approach, both areas of study will bring to bear their individual strengths to create an holistic learning experience for students. Students benefit because science becomes a practical application to solve problems; and they view CTE for its applied technical procedures as a foundation for applying new scientific skills.

Another important feature of such integration is the potential for collaboration with a local business, industry, or post-secondary institution. Students in the field learn the techniques of scientific inquiry and get exposure to important technology that they might not have access to in high school labs. While there are many exciting possibilities for learning in this integrated manner, CTE and science teachers will need time and support to carry out such important teaching/learning processes. Therefore, they must be afforded as much professional development as is possible.

English/Literacy Strategies:

English language and literacy skills are considered important core academic subjects in CTE programs. For many teachers, traditional methods of teaching English and literacy skills are not effective. Teachers noted that most students had trouble writing for purpose and to a variety of audiences. Students also had problems with reading comprehension. A number of schools have chosen to use the model advocated for mathematics by the NRCCTE. English teachers working in collaboration with CTE teachers use technical manuals and journals to reinforce students' reading skills. Selected articles from the technical journals and procedures from the manuals are required reading for students.

The teaching team developed a test for each reading assignment to evaluate reading proficiency. After reading the required materials, students were tested for reading level by grade and how well the student understood the content of the article. Students proceeded to the next reading level when they mastered concepts for their reading level. Typically, they moved to a more advanced level of technical literature with each success. The practice has promise because students get an integrated approach to English, and they are reading materials that are of interest to them. Addressing the writing requirements for an occupation and post-secondary education is also a challenge. CTE programs have long focused on writing competency because writing skills remain problematic, as they do in comprehensive schools. Remediation often occurs at the post-secondary level too. Remediation is a substantial cost to schools and post-secondary education, but worth the cost because coherent communication is required throughout life. CTE programs that are reform minded have demonstrated the use of career clusters and career pathways as a means to organize content that requires English and literacy skills. The use of a career academics is also a strategy used to enrich student learning. Students focus on one area of interest, while taking a series of English, math, and science courses. It seems that the most successful programs use interpersonal supports in school, provide easy access to materials that heighten career awareness, and work based opportunities that demonstrate the need for good communication skills.

From the Field:

Rhode Islands CTE programs have served a wide variety of learners and crafted programs that meet students' individual needs. However, in the past the CTE programs were adapted to prepare students for work. The stereotypes of low-skill, low pay continue to haunt the field. The problem that CTE is working to correct is the fact that many CTE graduates are moving into the Rhode Island workforce to fill entry-level positions that require low-level skills. The lack of attainment of basic academic skills also hampers the students' options to enter a post-secondary course of study.

Like other states, Rhode Island's CTE programs must reform their programs to ensure that students are adequately prepared with skills and knowledge to work or enter post-secondary education; that they have met high academic standards; and are given the skills to be lifelong learners. Lately, the challenge of creating opportunities that provide workplace relevance has been met with assistance from business and industry. The creation of lasting partnerships has helped improve student awareness in training and occupational exploration. These partnerships, especially with industry and business with high skill requirements, can provide insight into the academic requirements necessary to achieve industry standards and certifications. Students must become aware of these requirements before they enter the workforce. The overt identification of required standards and certifications during occupational exploration and training should instill students with the notion that they are being prepared for an occupation that requires lifelong learning strategies. Simply put: The skill requirements for the workforce of today will need to be constantly upgraded as technology becomes more advanced.

During the research for this report, it was suggested, several times, that Career and Technical Education programs should be governed and monitored by an entity separate and equal to the Rhode Island Department of Education. The belief is that a Department of Career and Technical Education (DCTE) could provide the missing coordination that is sorely needed to help reform programs. A focused and dedicated CTE unit would provide strong leadership and oversight on issues of program quality, student assessments, program assessment, program certification, teacher certification, and funding. As it is now, the Rhode Island Department of Education facilitates CTE program policy and direction. One organization, staffed by CTE experts would assist with the transition from a fragmented system to a high performing academic and technical program of study. The resources of the DCTE could be used to create strong partnerships with business and industry. Today, technical centers are left to their own designs to create these collaborations. Organizing a DCTE would go a long way to dispel that notion that CTE is a "second class" education pathway. Offering a better image of CTE would be possible with the use of assessment data that establishes CTE as a viable education choice. The formation of the DCTE would be instrumental in breaking down the isolation that appears to be problematic for CTE programs. Areas of content, best practice, and shared learning experiences could be developed across programs. Such collaboration between the State's Career and Technical Education centers does not presently exist, but would be an extraordinary benefit to the learning environment of students and CTE faculty.

Teacher Training and Professional Development:

CTE instructors have been trained to teach a specific trade and occupation. By and large they are not experts in other fields or core academics. For this reason, CTE directors encourage their faculty to learn cutting-edge content and methods through professional development activities. For instance, workshops and institutes that enable the learning of Science, Technology, Engineering, and Mathematics (STEM) units are offered regularly. One such program, which has lately been recognized for excellence, is Project Lead the Way (PLTW). With multiple course offerings in pre-engineering, teachers must participate in two-week institutes to become certified to teach courses like, Introduction to Engineering Design, Computer Aided Manufacturing, and Principles of Engineering. The participants can then return to their schools with the knowledge that they can teach PLTW principles with a sense of confidence.

Contextual learning strategies don't come easy either. Medrich (2006) stated, "Contextual teaching methods are not simple instructional tools. They are difficult for instructors to master, and if done poorly, they are best not done at all" (p. 24). With the numerous external and internal reform efforts that will impact CTE curriculum, professional development must be at the forefront of every instructor's agenda. Professional development activities are important to maintain teaching standards; especially for those instructors who must obtain state certification in their academic or technical field.

Student Characteristics:

CTE students who enter post-secondary education programs typically stay enrolled for the duration of their degree work. Students have learned goal setting and have a concrete idea about what the hope to achieve. CTE students have had structure and have had to meet standards in the past.

Funding:

The most contentious issue raised by directors and teachers alike, was that of program funding. It appears that the funding of CTE programs is inequitable and the system is far from coherent. The quote offered below provides some clarity to a the problem.

> Career and technical education is generally more expensive than regular education because of the specialized machinery, materials, shops, and so on. Districts with their own dedicated career and technical schools absorb the full cost into the district (although many of the buildings are owned and maintained by the state). Some districts share the cost of a career and technical center. Still others send their students to one of the two state-operated career and technical schools – Davies and the Met – which absorb the cost entirely for each student no matter where the child came from. Thus career and technical costs appear to be unevenly balanced among the districts (InfoWorks!, 2006).

Discussions related to CTE budgets followed a rather common path. Many schools which have under-funded programs use unique methods to raise money for supplies and support of students. Vending machines, student prepared meals, automotive services, and greenhouse sales were used to raise additional money to support programs.

Local funding is not an option for CTE programs. Funds come from the State based on a funding formula.

To gain equitable funding, the stakeholders must visit programs to see what is accomplished at the centers.

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Funding for Charter Schools Nationwide

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Although much has been written about charter schools, little attention has been given to the funding of these schools. The financial autonomy of charter schools depends on each state's charter school legislation, therefore causing a discrepancy in funding formulas across the country.[46] In states that regard charter schools as schools within a district, the charter schools' fiscal responsibilities are similar to those of other schools in the district. In states that treat charter schools as independent school districts, charter schools have the same fiscal responsibility and autonomy as other independent districts.[47] Most commonly, charter schools are funded at a level that relates to the spending per pupil in their respective districts. Another option is for charter schools to receive a state average level for funding. Both of these options are, however, problematic.

In the instance of charter schools being funded based on per pupil spending in the respective districts, schools may be funded very differently based on who sponsors the charter. This also gives those seeking charters special incentives to seek charters from some, but not other, districts. Therefore, those opening charters are more likely to seek approval from higher wealth districts than lower wealth districts.

Schools that are funded by receiving a state average face difficulty depending on the district in which they are located. This method discourages the conversion of existing public schools to charter schools in high-spending districts. New charter schools also have difficulty competing with other public schools in these high-spending districts. The state average method of funding also encourages the conversion of public schools to charter schools in low-spending districts, thus making it difficult for other public schools to compete with the independent charter schools[2].
There are two common ways of determining the number of pupils at a charter school and thus, the number for per pupil funding. The first is average daily attendance (ADA). This may give charter schools an incentive to discourage students with the potential for high absence rates. The other basis is average daily membership/average daily enrollment (ADM/ADE). A school is more likely to have more students enrolled on any given day than students present in the school on any given day. ADM/ADE will bring in more money. Charter schools receive general purpose funds and categorical program funds. General purpose funds come from local property taxes and the state and are primarily what fund the average daily attendance (ADA) money. Categorical funds received by charter schools are in the form of a block grant that includes 44 categorical programs.

[46] http://www.uscharterschools.org/lpt/uscs_docs/262. U.S. Charter Schools: Budget, Finance, and Fundraising
[47] Charter School Funding Issues, Steven Sugarman, UC Berkley. http://epaa.asu.edu/epaa/v10n34.html.

Typically, schools with higher paid teachers receive more money to spend per pupil than do those schools with lower paid teachers. This makes it an unwise financial decision for local public schools to convert to charter schools if their teachers currently are more experienced and higher paid.[2] On the other hand, schools with low average teacher salaries have a potentially artificial incentive to convert to charter schools. This translates to charters schools typically having to rely on mainly newer and lower paid teachers as compared with other public schools.

Start up costs and funding are additional issues that face charter schools nationwide. These costs include the launch of the school, hiring staff, obtaining furnishings and curriculum materials. This problem is compounded because the initial enrollment is often an uncertain number. Charter schools usually receive little or no funding for the school building itself. They may receive free space for buildings, they may receive funding to assist in payment for these buildings, or they may be expected to pay for buildings with money they already receive from other sources. Subsequently, these charter schools have to redirect substantial amounts of their funding to pay for space. This leaves the schools with less than adequate funds for ongoing educational programs. Even if a charter school receives free space or funds for a building, they often move multiple times before settling on a location that works.

Support Service Funding for Charter Schools Nationwide

Special education students and English Language Learners are yet another financial challenge that charter schools face. Charter schools can range from limited experience in working with students requiring support services to magnets for children with learning obstacles. Either way, charter schools appear to end up with an uneven distribution of special needs students compared with the respective state average. As far as special education funding, charter schools, like traditional schools, provide services and receive funding for special education students through a Special Education Local Planning Area (SELPA). The charter schools have to negotiate with the charter-granting agency to determine how costs, revenues, and responsibilities will be allocated.[48] The schools receive extra funding for each student that is identified as an English learner. Again the amount of funding varies from state to state and in between districts.

Charter schools often have ambitious programs that are not fully funded by local state and district formulas. There are grant programs that allow charter schools to apply for additional funding. Corporate sponsors can also provide funding for these schools.

It appears there is no consistent funding formula for the forty states with charter schools. There can also be a difference in funding from school to school in the same district. For example, in Washington, D.C., 100% of operations funding follows students, based on District of Columbia per-pupil information. Georgia has a specific funding formula that dictates the minimum amount of funding a charter school must receive, with funding beyond the minimum negotiated with the sponsor school district and specified in the charter. Kansas leaves the funding up to the discretion of the school district that contains the charter school. Different still is Wyoming, which guarantees 95% of funding

[48] Edsource Online. http://www.edsource.org/edu_chart.cfm

generated by the charter schools average daily membership, minus certain adjustments. Obviously, funding differs in virtually every state with charter schools[49] (StateNotes).

Charter Schools in Rhode Island

Rhode Island currently has 11 charter schools that are responsible for educating 2,203 students.[50]. In order for a charter school to open in Rhode Island, the individual district housing the charter must approve the request. After the request approval, the state board of regents may authorize the charter school. The length of the charter is five years. Only two charter schools are permitted per district unless the district contains more than 20,000 students. In this case, four charters may be granted.

Funding in Rhode Island Charter Schools

One hundred percent of state and school district operations funding follows students, based on average school district per-pupil revenues minus five percent of the state share. The school district retains this five percent for administration and impact. The charter school and the school district negotiate cost of services that the charter school wants the school district to provide.[4]

In terms of start-up costs, Rhode Island charter schools are not presented with state start-up funds or planning grants. However, if no federal funds are available, the state allows for the establishment of a system of interest-free loans provided from state funds; not to exceed the total of $150,000 for a single charter school.[4] A charter school may access aid for reimbursement of school housing costs if they are sponsored by the school district. If the charter school is not sponsored by a school district, they may apply for 30% reimbursement of school housing on a need basis.

Funding transportation to a charter school is not specified within the Rhode Island regulations governing charters. Other states, like North Carolina for example, pay for bussing if the charter school provides a transportation plan.

The Rhode Island Funding Formula

The charter school funding formula for the state of Rhode Island is based on the sending districts per pupil amount and the sending district's share ratio. The state pays five percent of the per pupil amount to the sending district and a share of the rest of the per pupil expense to the charter school[51]. Rhode Island's share of the per pupil amount is based on the sending district's share ratio. This means that the state pays for a larger portion of this cost for poorer districts and a smaller portion for more wealthy districts. The local district must pay the balance of the per pupil expense. Provisions are made for mid-year corrections if shifts bigger than 10 percent occur. The local district may still claim the student for all aid programs.

Policy Issues for Rhode Island Charter Schools

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[49] Statenotes: Charter School Finance. http://www.wcs.org/clearinhouse/24/12/2413.htm
[50] U.S. Charter Schools: Rhode Island State Profile. http://www.uscharterschools.org/cs/sp/viw/sp/32.
[51] RI Charter School Funding Formula. Rhode Island Department of Elementary and Secondary Education. http://www.ridoe.net/charterschools/Fundingformula.htm

- Presently $50,000 is allocated for start up cost however this amount should be reviewed in light of the various costs associated with implementation. Charters must hirer leadership personnel, write curriculum, locate a sight, and apply for 501C3 status with the $50,000 allocation.
- The formula used for housing cost should mirror the city, as school demographics must. At the present time a vocational school receiving a student receives 1.5 % of the housing cost allocated for that student. The same student transferring to a charter school will only receive 1 % of the housing cost.
- If a charter school has 200 students it must reflect the districts special needs population. Usually 20%, or 40 students, would be receiving special needs services with no additional funds made available to address this population. A weighted per pupil formula seems to be the best solution, as students sometimes come with multiple needs (ELL, Special Education, etc.).
- Article 31 money is embedded in the per pupil cost, although charter schools must report the amount of Article 31 money received for professional development allocated back to the state.

Professional Development: an Overview

Ron Diorio
University of Rhode Island

Educators must be lifelong learners. For teachers and administrators, effective practice, practice which results in improved student learning, requires continual professional learning. Each state in this country handles professional development in different ways; some better than others. This paper will discuss what professional development is and how the federal government, states, and individual schools and teachers fund professional development.

Professional development is a continuous process of individual and collective examination and improvement of practice. It should empower individual educators and communities of educators to make complex decisions; to identify and solve problems; and to connect theory, practice, and student outcomes. Professional development also should enable teachers to offer students the learning opportunities that will prepare them to meet world-class standards in given content areas and to successfully assume adult responsibilities for citizenship and work.[52] The bulk of teacher development comes through in-service development opportunities provided by schools and funded locally or with state dollars. According to the American Federation of Teachers, professional development should contribute to measurable improvement in student achievement as well as provide sufficient time, support, and resources to enable teachers to master the content and pedagogy and to integrate this knowledge and skills into their practice. The National Education Association (NEA) website[53] discusses finding by the National Staff Development Council (NSDC) that recommends that professional development include training, practice, and feedback; opportunities for individual reflection and group inquiry into practice; and coaching other follow-up procedures. Both organizations have recommended that the training be school based and embedded in staff work. Determining the quality of professional development is becoming more difficult due to the fact that decisions regarding professional development have become localized under site-based management policies. Further compounding the problem of assessing investments in professional development is the wide disparity between local training investments. It is worth noting that although professional development is typically viewed as a key to school reform; most states do not collect information related to development dollars in a coherent fashion.

Funding for Professional Development

The funds for professional development activities are part of large block grants from the U.S. Department of Education awarded to each state. Higher education departments receive 2.5% of the total block grant to make competitive sub grants.

[52] AFT, http://www.aft.org/topics/teacher-quality/prodev.htm
[53] NEA, http://www.nea.org/app/search/performSearch.do?queryText=Professional+Development

The New York City Department of Education offers low cost, high quality professional development for its teachers.[54] In Wisconsin's public and private schools, the Elementary Secondary Education Act Title II Higher Education Professional Development Program is a competitive grants program used for increasing student achievement in the arts, civics and government, economics, English, foreign languages, geography, history, mathematics, reading or language arts, and science, by improving the teaching and principal quality at the K-12 level. The funds provide grants to eligible partnerships.[55]

States such as Rhode Island, Maryland, New Jersey, and Maine have Professional Development quality standards. These include, "A Cycle of Continuous Improvement: The system of training and development is a cycle of continuous improvement"[56] and "Improves understanding of the academic, social, emotional, and physical needs of each learner and ensures that educators utilize appropriate teaching skills to enable students to meet or exceed their potential."[57]

To support improvements in teaching and learning and to help meet special needs of schools and students in elementary and secondary education, the U.S. Department of Education (ED) is delivering about $28 billion this year to states and school districts, primarily through formula-based grant programs. Titles I and II are parts of the No Child Left Behind (NCLB) Act of 2002 are examples of these grant programs. More than 45,000 public schools across the country use Title I funds to provide opportunities for professional development[58]. Title I, Part A**,** of the act requires school districts to use at least five percent of their Title I funds for professional development activities to ensure that teachers who are not currently certified as highly qualified meet that standard, as defined by the state, by the end of the 2005-06 school year. Schools identified as not having met their adequate yearly progress (AYP) goals must spend ten percent of their Title I, Part A funds on teacher professional development.[59] Title II, Part A, of the act provides funding for professional development in subject matter knowledge, improving teaching skills, assisting teachers to use the state content standards, and assessment.[8]

The Finance Project says the issue still remains that it is impossible to determine exactly how much the federal government spends on professional development. Most federal programs that provide support for professional development in education support other purposes as well, so it is difficult to determine the precise portion of funding within these programs that actually goes toward professional development activities.[60]

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[54] NYC Department of Education, http://schools.nyc.gov/offices/dhr/training/
[55] http://www.uwsa.edu/acss/ike/
[56] Maine Education, http://www.maine.gov/education/achievingresults/qsall.htm
[57] New Jersey Department of Education, http://www.statenj.us/njded/profdev/standards.htm
[58] NCTE, http://www.ncte.org/about/grants/topic/107748.htm
[59] California Science Teachers Association, http://www.cascience.org/PDFunding.html
[60] The Finance Project,
http://www.financeproject.org/Publications/Federal%20Funding%20Guide%20Update%20FINAL.pdf

Most of the federal programs providing funding for professional development in education fall into three main types: formula (or block) grants, project (or discretionary) grants and direct payments to individual students enrolled in higher education programs (as they pertain to assisting the finance of professional development for pre-service teachers). As noted above, some of the discretionary grant programs that support professional development have been consolidated into large state block grants under NCLB, but most individual discretionary programs still remain. While these smaller programs continue to exist, they provide fewer available dollars for professional development than the large state block grants, such as Improving Teacher Quality State Grants, created by NCLB, and Title I. Block grants distribute a fixed amount of funding to states or localities based on established formulas that vary from grant to grant, and these programs tend to include relatively large dollar amounts. Often, formulas are connected to population characteristics or demographics-- for example, the number of children under a certain age that live at or below a specified income level within the school district.

Generally, federal block grants are appropriated to designated state agencies, such as state education agencies, that administer the funds. In education, state agencies pass the majority of block grant funding on to other public or private entities, primarily districts, through contracts or interagency agreements.

Discretionary grants related to professional development typically support more specific professional development purposes, such as the teaching of reading and writing, bilingual education, special education, technology training, or environmental education and training. Congress annually appropriates an overall fixed level of funding for each discretionary grant program; the grants are then typically awarded by the authorizing agency on the basis of competitive applications. Eligible applicants depend on the particular program but may include states, local education agencies, non-profit or private entities. There are also several discretionary grants that encourage or require collaborative efforts or partnerships, such as those between local school districts and private businesses or local organizations.

Under direct payment programs, the federal government provides financial assistance directly to individual beneficiaries who satisfy federal eligibility requirements. The largest programs in this category (including the Federal Pell Grant Program, Federal Perkins Loan Cancellations, Federal Supplemental Educational Opportunity Grants, and Federal Work Study Program) provide payments to institutions of higher education for financial assistance to students. These programs are included in this guide because they can help finance the professional development of those preparing to be teachers.[9]

Non federal grants are also a source of funding for individual schools and districts. Over 300 small grants of $1,000 to $5,000 are awarded each year by the NEA.[5] The NEA Foundation's grants fund classroom innovations or professional development for improved practice in public schools and higher education institutions. Virtually all states have a Council of the Humanities that provide grant-based funding and there are several

opportunities for corporate sponsors to participate, i.e. the Bill and Linda Gates Foundation and the Braitmayer Foundation.

Guiding Principles

A number of experts and organizations have suggested that the most promising professional development programs or policies are those that:

- Stimulate and support site based initiatives. Professional development is likely to have greater impact on practice if it is closely linked to school initiatives to improve practice.
- Support teacher initiatives as well as school or district initiatives. These initiatives could promote the professionalization of teaching and may be cost-effective ways to engage more teachers in serious professional development activities.
- Are grounded in knowledge about teaching. Good professional development should encompass expectations educators hold for students, child – development theory, curriculum content and design, instructional and assessment strategies for instilling higher order competencies, school culture and share decision making.
- Model constructivist teaching. Teachers need opportunities to explore, question and debate in order to integrate new ideas into their repertories and their classroom practice.
- Offer intellectual, social and emotional engagement with ideas, materials, and colleagues. If teachers are to teach for deep understanding, they must be intellectually engaged in their disciplines and work regularly with others in their field.
- Demonstrate respect for teachers as professionals and as adult learners. Professional development should draw on the expertise of teachers and take differing degrees of teacher experience into account.
- Provide for sufficient time and follow-up support for teachers to master new content and strategies and to integrate them into their practice.
- Are accessible and inclusive. Professional development should be viewed as an integral part of teachers' work rather than as a privilege granted to "favorites" by administrators.[61]

Policy Issues for Rhode Island related to Professional Development

- Rhode Island School Administrators and Professional Development Directors would like to have free reign in designing P.D. activities for their districts.
- School districts are compelled to provide professional development activities based upon restrictions from dollar set asides rather than offer professional development activities deemed necessary to improve upon areas identified by such things as school improvement teams, strategic plans, or teacher evaluations.

[61] www.ed.gov/pubs/CPRE/t61/t61c.html

- Educators need time to search, and integrate new professional development initiatives into their bag of tricks. This leads to increase cost.
- The need for follow – up professional development activities needs to be intergraded into the process.
- Mentoring programs need to be longer than one year.

Overview of In$site

Bruce Cooper

In$ite was created in 1996 at Coopers & Lybrand, LLP, based on Bruce Cooper and Bob Sarrel's *Finance Analysis Model* (FAM), to do something new but simple. We sought to "functionalize" and "locationalize" school budgeting; to put money into "buckets" and to learn just how much of the money per student that reaches each and every school, is spent on *direct instruction* in the classroom. We thus hoped to learn how much of school resources are actually spent on direct student learning.

Sounds easy. But Rhode Island has taken on the task of using *In$ite* in every school, and every district in the State. While *In$ite* is in place, to the best of my understanding, it's not being used to its fullest extent. Money should be traced from the system to the school, from the school to the classroom, to the benefit of the student. And then four levels of comparisons and ratios should be calculated, to help track the money from the system to the child, and to help determine just how efficiently RI is spending its money:

1. What amount and percent of spending occurs at the district, school, and classroom levels?
2. What is the ratio of total average RI spending, against spending in each of the districts in the state, and in the districts' schools by type (high school, middle and elementary).
3. Of the funds reaching all schools, and each school, what percent is reaching the classroom for Direct Instruction (including teachers' pay/benefits, substitute teachers, paraprofessionals/aides, textbooks, materials and equipment)?
4. And overall, can the state examine the highest and lowest outlier districts, and schools, to see the level horizontal equity by function and location?

The information from the State's database show just how far we can go toward completely implementing *In$ite* in Rhode Island, and what additional analyses are useful and necessary to make full use of the model and data.

Data There, But Analyses Often Are Not

In examining the spending structures and data in the State of Rhode Island, we see evidence that the state has the financial information from *In$ite*, but has failed to build and apply the analysis models to mine the information and reach key conclusions. It's the old case of having all the answers, but not asking the questions. As we shall explain and demonstrate, key data are already available and reported; with some recasting and modeling, the State could learn these key results:

1. How do the district rank in terms of total spending on education (per student), total spending in each school (by individual and by type—elementary, middle and secondary)?
2. How much and percent of the funding reaching each school is delivered to the Classroom for direct INSTRUCTION (including key budget codes for teacher

salaries and benefits, substitute teachers, paraprofessionals; books and materials; technology and other classroom equipment).

3. What are the outliers, highest and lowest spending by district, type, SES, and size, within districts, and between them?
4. What are levels of efficiency (money spent overall versus expenditures in the classroom and quality, controlling for school district and school size and student population)?

Rhode Island lists its data on-line by District, and for the State, but not by school. Lists of data are broken out by function, and line-items by school; however, the aggregation is not done by function, school, and type of student. The model is conceptually a three-dimensional (cube), with one side being the *Function* (Instruction, Student Support, Facilities, Leadership etc.), *Location* (school-by-school including by type: Elementary, Middle, and High Schools), and by *Type of Student* (Regular Education, Special Education, Limited English, Immigrant).

These data are available, and are accessible online as Microsoft Access data bases, but are not aggregated and compared across settings. In descending order, we need:

Barrington Public Schools: The next four pages show the breakout of spending for the 2004-2005 school year for the Barrington Public Schools, with Average Daily Membership (ADM) of 3,341 students, by the five basic In$ite functions: Instruction, Instructional Support, Operations, Leadership, and Other Commitments. Each "function" includes the sub-functions that are deemed appropriate. Instruction, for example, include the costs of teacher salaries, substitutes, paraprofessionals, classroom technology, and instructional materials, with total Instruction expenditures of $21.454 million, or $6,422 per pupil, comprising 61.7% of District spending.

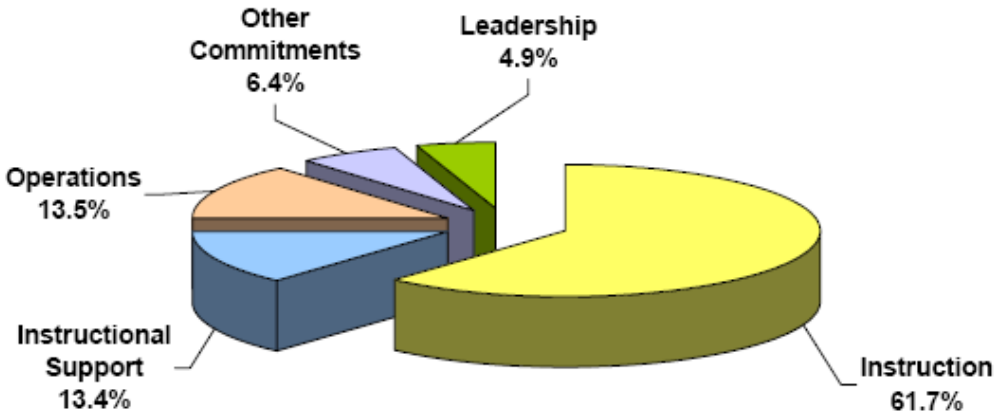
Table 1 also breaks out the other functions, with about 13% in Instructional Support (e.g, Guidance, extra-curriculum, nurses, librarians) so that when the District combines classroom and non-classroom direct, face-to-face services, nearly 75% of funding benefits students directly.

Other costs, as shown in the following table, include about 14% for school Operations, 5% percent for Leadership (Principals, Assistant Principals, School Offices, Deputy Administrators, the Superintendent and School Board, and Legal. The data also show an additional 14.4 percent that includes Other Commitments (Budget Contingencies, Debt Service, Capital Projects, Pass-Throughs, Enterprise Services, and Claims and Settlements). In each figure and table, we see the total, per pupil, and percent of total district spending. It appears that Barrington is typical, or average as we look at other districts by function, with a little less than two-thirds going into the classroom.

Barrington Public Schools

#1 Total Expenditures
(All Funding Sources)
By Five Major Functions
July 2004 - June 2005

July 2003 - June 2004
(Previous Year)



District Enrollment (ADM): 3,341	Amount	Per Pupil	%-To-Total Expenditures
Instruction	$21,454,257	$6,422	61.7%
Instructional Support	$4,654,355	$1,393	13.4%
Operations	$4,699,751	$1,407	13.5%
Other Commitments	$2,241,400	$671	6.4%
Leadership	$1,704,346	$510	4.9%
Total District Expenditures	$34,754,108	$10,402	100.0%

2005-01-01-01

Function by School by Classroom

While this information is useful at the aggregate, district level, we could also use similar data on each school within the district, to see if types of schools (elementary, middle, and high schools) are receiving equitable amounts and percentages, and whether different types of students are being well serviced.

The ***In$ite*** Model, as explained, was designed to be three dimensional: by function by location (school by school by type), and by student characteristics. Barrington does not report spending by individual schools for its 3,348 or so students; nor by type of student (poor, ESL, special needs, and regular education). So we have the basis of comparison, but not the useful school-level data by student that we need. We have downloaded a number of excellent reports off the RI dataset, which show information by district, function, type of school, on a total dollar, per pupil, and percentage basis, paving the way for the same analysis by school.

Comparisons by School Type and District

Even though the Rhode Island **In$ite** model has data that can be disaggregated to the District (Functional), we took a look at the information across districts by school type (but not by individual school). As shown in the table below, we see one of the uses of the model, permitting us to do "outlier analysis," looking at the highest and lowest spending district schools types (elementary, middle and high school), calculated by dividing the number of students in each type of school into the spending by the type.

High Spending Outliers in Rhode Island School Districts by School Level (Elementary, Middle, and High School), 2004-2005.

District	School Level	Spending	Enrollment by Level	Per Pupil Spending
High End: South Kingstown	Elementary	$18.96 million	1555	$12,192
Narragansett	Elementary	$7.61 million	580	$13,124
Narragansett	Middle Schools	$7.14 million	543	$13,156
Narragansett	High Schools	$7.01 million	512	$13,693
Central Falls	Elementary	$20.86 million	1731	$12,049
Central Falls	Middle Schools	$9.54 million	841	$11,345
Central Falls	High Schools	$11.53 million	937	$12,304
Davies Career and Technical	High School	$12.31 million	761	$16,184

Data show that the highest spending high school, middle and elementary schools (by type) in the State of Rhode Island – leaving out alternative and special schools – were located in Narragansett, an island, at around $13,693 per student for the High School,

$13,156 per student for the Middle School(s) and $13,124 per pupil for the Elementary school(s). Interestingly, another much larger district's high school(s), in Middletown, RI, spent over $9.10 million dollars (divided by 741 students attending the school(s), meant that this High School spent $13,282 per student, the highest in the state for a regular secondary school. The highest outlier by type in the State is Davies, a high school that spent $16,184 per student ($12.13 million) on 761 students. In many cases such as Narragansett and the Davies Career and Technical high school there are readily available reasons why their costs are more. One is an island and the other a career/tech school. But in other cases, further analysis may be warranted.

At the low end of the distribution, we find individual schools such as Kingston Hill Academy which operates with relatively low per pupil spending despite its small size, which typically leads to much higher costs. Further, we suspect that Kingston Hill Academy must also take on some district level functions at the school level. At the other end of the spectrum though only a few miles down the road, average elementary school expenditures per pupil in South Kingston school district were $12,192 per student. Yet, the state does not report in any readily available and transparent manner, the per pupil expenditures of each elementary school in South Kingston School District for comparison with Kingston Hill Academy.

Low Spending Outliers in Rhode Island School District by School Level (Elementary, Middle, and High School), 2004-2005. (but not by site)

District	**School Level**	**Spending**	**Enrollment by Level**	**Per Pupil Spending**
<u>Low End</u>: Kingston Hill Academy	Elementary	$0.849 million	120	$ 7,078
Woonsocket	Elementary	$27.90 million	3,107	$ 8,978
Woonsocket	Middle Schools	$7.01 million	1,587	$ 8,046
Woonsocket	High Schools	$16.55 million	1,902 6,696	$ 8,699
Foster-Glocester	Middle School	$5.21 million	698	$ 7,464
Foster-Glocester	High School	$8.33 million	976	$ 8,540
Foster	Elementary	$3.81 million	327	$11,650

Again, it would be useful to drive the cost down to EACH school, by type, and for each Function. Primarily, we'd be interested in knowing how much funding per student and as a percent of district and school-site expenditures reach the classroom for direct Instruction, and Instructional Support.

Woonsocket is among the lowest spending districts by school level, with Middle Schools spending $8,046 per student, High Schools at $,8,699 per student, and Elementary

schools at $8,978 per pupil. Woonsocket is a larger district with some 6,696 students. Foster-Glocester (and Foster) is interesting because it is among the lowest spending on Middle and high schools at $7,464 and $8,540 per student, while the Foster elementary schools are higher $11,650 per student. But without school-site data by function, it's difficult to know why the Foster Elementary is high and Glocester-Foster middle/high school are lower.

The range, then, from highest to lowest spending is around $6,000 per student, with the high end at approximately $13,000 and the low end at $7,000 per pupil respectively – 41 percent different between the low-end and high-end. The one apparent substantial outlier was Davies Career and Technical High School, that spent $16,184 per student, double the low-end Districts and schools.

The Davies example, however, like the previous Kingston Hill Academy example raises the question of the appropriate organizational level of analysis. Davies like Kingston Hill is an independently operated, publicly finance school. In the case of Davies, the school is a specialized high school. As such, it is most relevant to compare Davies expenditures not with aggregated grade level expenditures for nearby districts but with expenditures for similar school sites, if any exist. The increased prevalence of independently governed schools (typically Charter schools) in Rhode Island increases the need for school level comparisons across individual sites.

We then used the Rhode Island ***In$ite*** data to track the funding for the high and low outliers to the overall functional spending, concentrating on Instruction. The high-end overall spending districts, as mentioned earlier were Narragansett and Little Compton, as well as several unusual schools like the "alternative" school at $13,760 per student in Westerley, RI, and the New Shoreham Elementary school, with only 94 children, the state's *offshore* district with unique constraints. Little Compton is also a relatively rural district, serving only grades K-8, creating different cost pressures.

Differences by Function and Location

Similarly, we can also track and compare spending by district and by function, but a typical consumer of RIDE's web-based content cannot readily extract which school sites are spending what by function. Since the key variable in the ***In$ite*** model is classroom Instruction (including teacher, substitutes, paraprofessional salaries, textbooks and materials), we need to be able to see which schools are receiving the funding and how they are allocating them among the functions in that school.

The table below shows the high-end and low-end spending by Instructional functions, this time, not disaggregated by grade level. When we look at the Instructional function spending for the high-end spending districts, we don't necessarily see high-spending districts expending higher levels of funding in the classroom. This is not an uncommon pattern. Other researchers have shown that districts spending more, often spend more in places other than instruction. Such findings might occur because of differences in the cost structure of districts spending more, such as differences in overhead and transportation costs for a district like Narragansett. However, others have shown that districts that

simply have the ability to spend more (perhaps due to strong tax base) also tend to spend more on functions other than direct instruction.

Central Falls spent between $11,345 per pupil for Middle Schools to $12,303 per student in High Schools, the overall district average "in the classroom" for Instruction was only $6,345 per student, about half of current expenditures per pupil.

District	FUNCTION	FUNDING	ENROLLMENT	Per Pupil
High End: Middletown	Instruction	$20.05 million	2,611	$ 7,679
Narragansett	Instruction	$13.91 million	1,679	$ 8,287
Newport	Instruction	$20.27 million	2,774	$ 7,306
New Shoreham	Instruction	$2.11 million	143	$14,784
Low End: Cumberland	Instruction	$25.94 million	5,285	$ 4,909
Kingston Hill Academy	Instruction	$0.467 million	120	$ 3,894

When we compare per pupil spending in the classroom, by district, across the state, we see a range from $14,784 per student in New Shoreham (with 143 students), compared to the low in Kingston Hill for Instruction of only $3,894 per pupil. Indeed both are peculiar cases, but even setting those cases aside, the range in instructional spending per pupil from Cumberland to Narraganset is $4,908 to $8,286. That said, the coefficient of variation – a relatively standard measure of school finance equity – is about 10% for instructional spending across Rhode Island districts, indicating that 2/3 of children attend districts that spending within 10% of the mean on instruction. This level of variation is generally considered acceptable, but we have not accounted for potential legitimate differences in costs.

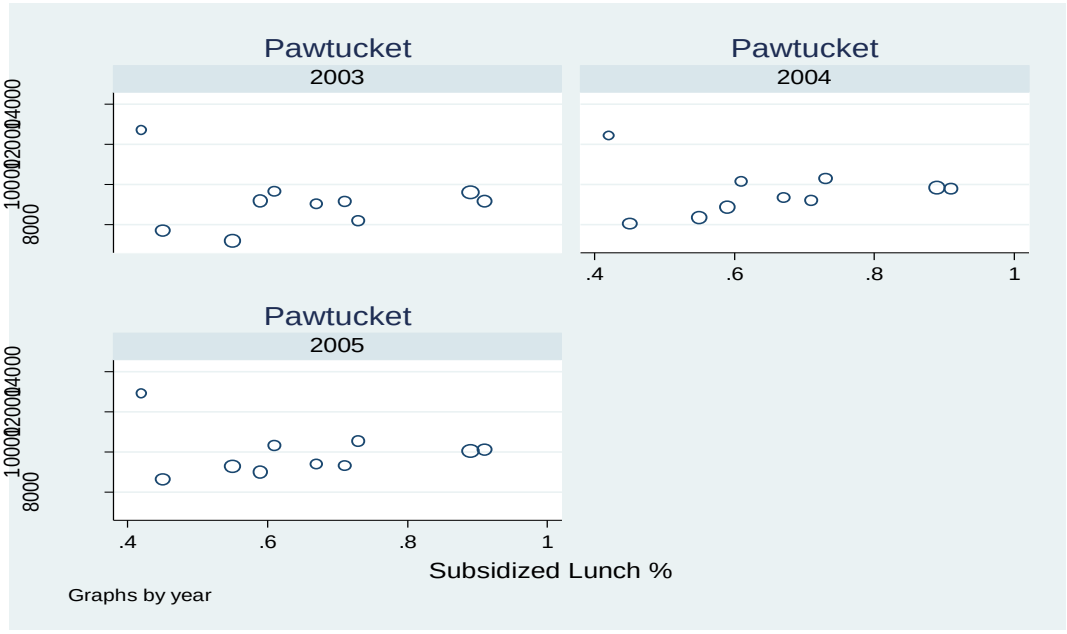
Relating Poverty to Spending

One assumption in modern school finance is that states provide more funding for students with the greatest needs. The following graph shows the relationship between poverty (free and reduced lunch) and spending for Rhode Island elementary schools. Overall, there is a gradual positive relationship between school level poverty shares and school level budgets per pupil, at the elementary level across all Rhode Island districts. That positive relationship exists for each of the 3 years of data. Poverty rates, along the horizontal axis range from 0 to 100%. In the chart, bubble size represents school

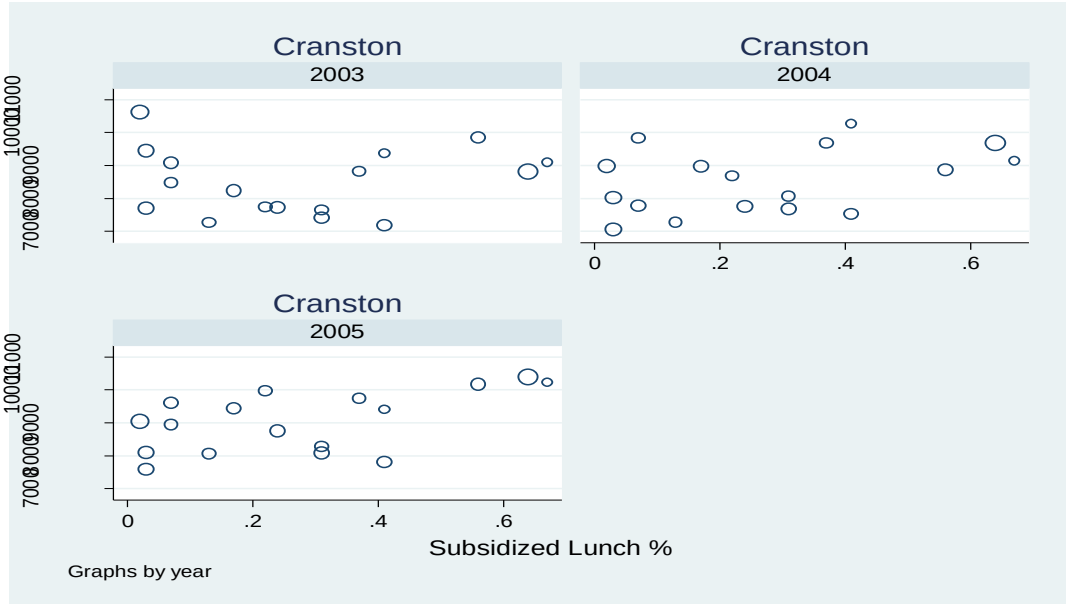
enrollment size. Clearly, there are some significant outliers. A handful of elementary schools spend near or above $20,000 per pupil.

To accomplish this analysis in which we generate school site per pupil expenditures, we had to dig deeper into the Access Data-bases, construct our own school site identifier (combining district ID and location variables, then merging them with an additional data bridge provided to use by RIDE's In$ite support staff). That is, we went to greater lengths than should be necessary to generate school site budget information across all schools statewide.

The next figure explores the relationships between poverty rates and per pupil budgets, across years, within Pawtucket school district and Figure 3 explores the same relationships in Cranston. Both figures include elementary schools only. In Pawtucket, with the exception of one relatively small low poverty school with high spending per pupil, there appears to be a gradual positive relationship between spending per pupil and poverty rate with low poverty schools spending just over $8,000 per pupil and higher poverty schools spending about $10,000 per pupil.



The next figure reveals a patter than for Cranston, at least in 2003 and 2004 is much less clear than in Pawtucket. In fact, in 2003, it would appear that higher poverty elementary schools in Cranston had lower per pupil budgets than lower poverty schools. By 2005, that relationship appears to have been turned around.



Here, we present only a snapshot analysis of what one might do with such data. School-site spending, by function, location, and student type, is important in Rhode Island for determining how much of the state's funds are reaching students for direct classroom

Instruction and Student Support services, by school. Also, as issues of inter-school and community equity and adequacy, as well as accountability under No Child Left Behind, become more important nationally, Rhode Island will come under increased pressure to account for funds and track them to the children for direct, face-to-face services. ***In$ite*** provides the data and the models for tracking and accounting for these funds and their uses.

And as districts experiment with site-based management and decision-making, it will benefit the individual school principals and staff to know how much funding they are getting and be allowed to have some control over how these dollars are being spent, in light of the needs of their schools' children. And if RI experiments with Weighted Student Funding (Formula), called WSF, whereby funding is weighted based on the needs and characteristics of each school's children (poor, gifted, special needs, limited English-speaking skills), then accounting for dollars at each school for each function, will become even more essential.

Building a New and Better System in Rhode Island

The steps to improved use of financial data are clear.

Step 1: Relate Line Items to functions, using the state chart of accounts and General Ledger. We have examined the line-items and find that the system works well in aggregating each item into is proper "box", by function.

Step 2: Aggregate spending by function for all districts, allowing comparisons for high and low outliers, as shown in Table 3 and 4. Taking each district, we can compare per-pupil and percentages by function, to determine levels by function.

Step 3: Disaggregate spending to the individual school level, to allow comparisons by school, by school type (elementary, middle, and high school) for spending and percent of spending. In NYC and the State of South Carolina, both which use variations of In$ite, one can look at every school in the city or state, and compare their spending by dollars, per pupil, and percentages.

Step 4: Perform outlier analysis by school and function, to determine characteristics of high-spending and low-spending school in the classroom. We can then cluster the high-end spending districts, and the low-end, to see what the characteristics and qualities are. Are larger schools more efficient, putting more into the classroom and less into Leadership, Other Commitments, and Leadership, than smaller ones that have higher "overhead" as a ratio of overall spending?

Step 5: Isolate spending by student type (general education, special education, low income/Title 1, Limited English Proficient, ESL). The next step is to see how spending relates to student types since Special Education is more costly, and we can compare the costs of similar types across districts and schools.

Step 6: Relate school and function spending to student programs and academic outcomes. Do schools that drive more spending to classroom provide better programs with better academic results? What can be done to reduce "overhead" costs (less spending on Operations, Leadership and Other Commitments) and use more resources for teaching and learning. When we first did this analysis in New York City, only 31% of the system's funds were reaching children in the classroom; by 2001, the percent had risen to 54% overall, with some schools higher and lower.

Special Education in the United States, 2007

Report by Robert A. Shaw
Brown University

The current scene for K-12 special education in the United States was set in 1975, with the passage of the Education for All Handicapped Children Act (PL94-142). This Act guaranteed children with disabilities a free public education to meet their individual education needs in the least restrictive environment possible. Standards-based reforms provided the policy framework for the 1997 and 2004 reauthorizations of this Act, now titled the Individuals with Disabilities Education Act (IEDA), ensuring that students with disabilities will have access to the same challenging curriculum as other students and participate in assessments as a way to mark their progress toward improved results. The No Child Left Behind Act (NCLB) of 2001 placed additional requirements on states, districts, and schools to report separately on the academic performance of students with disabilities, track their progress over time, and report regularly to parents and the community. (Abt Associates, 2006). This report provides an overview of a number of current issues in special education in the United States.

Special Education and Standards-Based Reform

A six-year study of the effectiveness of IDEA commissioned by the Department of Education in 2000 found that:

- Substantial Action Was Taken by States to Align Special Education Policy with Standards- Based Reform. States responded quickly to federal special education mandates in the 1997 reauthorization of IDEA by establishing an accountability infrastructure, and they took substantial action to support districts and schools in aligning special education policies with standards-based reform. For example, at least 96 percent of students with disabilities participated in statewide assessments; almost all states established the same content standards for students with disabilities as for students without; and almost all states publicly reported on the performance of students with disabilities on state- or district-wide assessments.

- States and Districts Strengthened Parent Involvement. At every level, education agencies took action to strengthen the involvement of parents of children with disabilities. States provided resources and established guidelines. Districts and schools used their resources to develop written materials for parents – focused on such issues as understanding IDEA, transitioning from secondary schools to adult life, and participating in assessments – and to offer training. Few states and districts used any dispute-resolution procedure to resolve conflicts with parents of students with disabilities. About one-fourth of districts used alternative dispute-resolution procedures to resolve conflicts.

- More Coherent Action by States, Districts, and Schools Is Needed to Prevent Students from Dropping Out. Increasingly, states are reporting publicly on dropouts among students with disabilities and rewarding and sanctioning districts and schools on the basis of dropout rates. Relatively few states or schools, however, took action to discourage students with disabilities from dropping out of school. For instance, only about half of the states allocated resources for dropout prevention and even fewer issued dropout-prevention guidelines, although more than half of the districts affirmed that they had issued such guidelines. Few secondary schools tracked multiple dropout risk factors of students with disabilities.

- Schools Lagged in Building the Capacity to Educate Students with Disabilities. The academic performance of students with disabilities is unlikely to improve without increasing school capacity – hiring and retaining well-prepared teachers, facilitating teachers' access to professional development, making staff members available to assist teachers, and using data to reach informed decisions. School principals reported that most of their special education teachers are well prepared to educate students with disabilities and that many of them have received professional development on teaching students with disabilities. Nonetheless, few principals reported the same for general education teachers, who have increasing numbers of students with disabilities in their classrooms. In addition, though many schools and districts are actively collecting data on test scores, dropout rates, and attendance, schools are not following through by using the data to plan professional development. (Abt Associates, 2006)

Definition of "Students with Disabilities"

Every state defines who is eligible to receive special education and related services. Some states choose to define special education students using the same disability criteria as the Federal Individuals with Disabilities Education Act. Other states make their own "student with disabilities" definition. The state definition serves as a guide, along with specific disability definitions, for determining eligibility criteria when evaluating a child for inclusion in special education programs. A small percentage of states, such as Rhode Island, choose to allow the state board of education or the state department of education to make such definitions.

Further, states are allowed to set their own provision of services criteria for students with disabilities. Typically, students with disabilities are allowed to attend more hours of school than their regular education counterparts. Many states mandate only that children attend school starting at age 6 and until age 16 or so. However, many special education attendance criteria allow students to receive special education services from the state department of education and the local school district beginning at initial diagnosis, which may be birth. Additionally, the average maximum age for students to receive services from the state and/or local school district is 20.88 years of age. A typical high school student graduates at around 18 years of age; thus special education students are, on average, allowed to attend public school for three additional years. (Education Commission of the States, 2004).

Response to Intervention

The reauthorization of the Individuals with Disabilities Education Act in 2004 (IDEA 2004) focused national attention on a growing successful practice in the general education classroom – Response to Intervention – to assess and support struggling learners. IDEA 2004 allows school districts to use Response to Intervention rather than a severe discrepancy between achievement and intellectual ability to diagnose a specific learning disability. The Act also allows local education agencies to use up to 15% of their federal funding to develop and implement coordinated, early intervening services for students in kindergarten through grade 12 who have not been identified as needing special education but who need additional support to succeed in a general education environment. Thus, RTI is an important tool not only in special education but also in general education classrooms.

RTI provides an alternative means of gathering information to be used when classifying students for special education. When a student is identified as having difficulties in school, a team provides interventions of increasing intensity to help the child catch up with the rest of his or her peers. After interventions have been tried and proven ineffective, the child may then be referred for additional, special education services. (James, 2004).

Transition to postsecondary education or the workplace

State data reported by the Department of Education show that in the 2000-01 school year, 68% percent of IDEA students completed high school with either a standard diploma (57%) or an alternative credential (11%). Completion rates ranged from 45 percent to 83 percent depending on disability type. The high school completion rate was the lowest for youth with emotional disturbances and the highest for youth with impairments affecting hearing or eyesight. Despite concerns that states' increasing use of exit examinations would result in more IDEA youth dropping out of high school, high school completion patterns have remained fairly stable, perhaps in part, because states have generally offered alternative routes to high school completion for youth with disabilities. However, what happens to IDEA youth after they leave high school is difficult to determine. Less than half of the states routinely collect data on students' employment or education status after graduation, and existing data collection efforts have limitations. Despite limitations of individual states' efforts, state studies taken together show that IDEA youth were much more likely to enter employment than postsecondary education or training programs. In Wisconsin, for example, 80 percent of IDEA youth reported being employed and 47 percent reported attending some type of postsecondary education institution one year out of high school. (General Accounting Office, 2003).

There is no comparable data source that can be used to compare high school completion rates for IDEA and general education students. The National Center for Education Statistics (NCES) had data from 33 states on all youth who completed high school during the 1999-2000 school year, as well as data from 36 states and the District of Columbia on all youth who dropped out during that year. These data show that among the 33 states, high school completion rates for all youth ranged from about 63 percent to 89 percent. (General Accounting Office, 2003).

Transition problems affecting IDEA youth include those related to self-advocacy training and insufficient information about the transition process. Youth responding to a national survey by a youth association reported problems identifying and learning how to ask for specific accommodations they need to succeed in school and the workplace. In addition, parents said they did not have information about the spectrum of education and employment service providers that were available. Other problems included an absence of linkages to adult service providers, insufficient vocational education and work-related experiences obtained during high school, and lack of transportation after high school to the job site or postsecondary school. (General Accounting Office, 2003).

Over-representation of minority students

The overrepresentation of minority students in special education has been a topic of much debate over the past three decades (e.g., Hosp & Reschly, 2004). Both social and special education process factors have been identified as contributing to this complex issue. Social factors include poverty, health risks, and the interpretation of cultural and language differences as signs of disability. Process factors believed to contribute to the minority-overrepresentation problem include the misidentification of students during the referral process, limited participation of minority parents in the special education identification and planning process, and lack of culturally appropriate interpretations of assessment results. The misidentification and misclassification of minority students for special education can in turn lead to inappropriate placements, increasing the time these students spend in separate or segregated settings. Almost all states provide written guidelines on the placement of students with IEPs in the least restrictive environment. However, fewer than half the states provide schools with specific guidelines or specific resources to ensure the placement of minority students with IEPs in the least restrictive environment. (Elementary and Secondary Schools Technical Assistance Center, nd).

Universal Instructional Design and Differentiated Instruction

Two teaching strategies offer the possibility of increasing the integration of students with disabilities into general education classrooms. Universal Instructional Design is the design of instructional materials and activities that allow learning goals to be achieved by individuals with wide differences in their abilities to see, hear, speak, move, read, write, understand English, attend, organize, engage, and remember. While allowing students with disabilities to engage in a course with few special accommodations, the flexibility of courses using these principles also helps other students learn the course material in ways most appropriate to their unique learning styles and preferences. UID is achieved by means of flexible curricular materials and activities that provide alternatives for students

with disparities in learning styles, abilities and backgrounds. UID acknowledges differences among students and uses them to strengthen the learning process.

- Focuses on accessibility as an integral component of instructional planning.
- Includes flexibility in the course's overall instructional design, so that fewer accommodations need to be made for individual students.
- Benefits students with many different types of learning styles and needs.

As defined by CAST (Center for Applied Special Technology), the basic premise of universal instructional design is for curriculum to include alternatives to ensure accessibility to students with differing backgrounds, learning styles, abilities and disabilities. The "universal" in universal design does not imply that one size fits all; instead, it stresses the need for flexible, customizable content, assignments and activities. (Ivy Access Initiative, 2002).

Differentiated instruction is a process to approach teaching and learning for students of differing abilities in the same class. The intent of differentiating instruction is to maximize each student's growth and individual success by meeting each student where he or she is, and assisting in the learning process. The process begins with a pre-assessment of each student's readiness and prior knowledge and includes flexible grouping and clear linkage between instructional goals and classroom activities (Tomlinson, 2001).

Charter Schools

Charter Schools, with their unconventional teaching approaches and generally small student numbers, present both special challenges and special opportunities for teaching students with disabilities. The National Association of State Directors of Special Education (NASCSE) has produced a series of "primers" for charter schools to help ensure that they meet Federal guidelines for the education of students with disabilities. (National Association of State Directors of Special Education, 2006)

Teacher recruitment, training, and retention.

The 2001 No Child Left Behind Act (NCLB) and the 2004 reauthorization of IDEA both require that special education teachers be Highly Qualified. This means that special education teachers who provide direct instruction in core academic subjects must meet the following requirements:

- State special education certification or license;
- At least a bachelor's degree;

- Has not had a waiver of licensing requirements "on an emergency, temporary, or provisional basis"

- Meet the "No Child Left Behind" Act (NCLB) requirements for an elementary school teacher (i.e., test of basic skills in multiple core content subjects, which may be the test taken as part of special education licensure); OR

- In the case of instruction above the elementary level, has subject matter knowledge appropriate to the level of instruction being provided, as determined by the state, needed to effectively teach to those standards.

There is currently a serious national shortage of special education teachers who meet these qualifications. Congress is considering modifying how the highly qualified teacher provisions of *NCLB* apply to special education teachers. (National Education Association, nd).

A related issue is the preparation of general education teachers to meet the educational needs of students with disabilities. Special education teachers are well prepared to educate students with disabilities, but general education teachers are less well prepared. Special education teachers are more likely to pursue professional development. During 2004–2005, most principals reported that their special education teachers were well prepared in the areas of IEP implementation, improving student performance, accessing the general education curriculum, and using positive behavioral approaches. In contrast, fewer than half the principals reported that most of their general education teachers were well prepared in these areas for students with disabilities (Abt Associates, 2006).

Financing

During the 1999-2000 school year, the 50 states and the District of Columbia spent approximately $50 billion on special education services, amounting to $8,080 per special education student. The total spending to provide a combination of regular and special education services to students with disabilities amounted to $77.3 billion, or an average of $12,474 per student. An additional one billion dollars was expended on students with disabilities for other special needs programs (e.g., Title I, English language learners, or gifted and talented students), bringing the per student amount to $12,639. The additional expenditure to educate the average student with a disability is estimated to be $5,918 per student. This is the difference between the total expenditure per student eligible for special education services ($12,474) and the total expenditure per regular education student ($6,556). (Center for Special Education Finance, 2004).

Over the period from 1977-78 to 1999-2000, total spending to educate special education students has increased from 16.6 percent to 21.4 percent of total education spending, about a 30 percent increase. Over the same period, students identified as eligible for special education services increased from 8.5 to 13 percent of total enrollment, a more than 50 percent increase. At the same time, the ratio of spending on special education students to spending on regular education students has declined from 2.17 to 1.90. Thus,

the increase in special education spending that has occurred over the past twenty plus years appears largely a result of increases in the number of students identified as eligible for the program. (Center for Special Education Finance, 2004).

Local education agencies received $3.7 billion in federal IDEA funding in 1999-2000, accounting for 10.2 percent of the additional total expenditure on special education students (or $605 per special education student), and about 7.5 percent of total special education spending. If Medicaid funds are included, federal funding covers 12 percent of the total additional expenditure on special education students (i.e., 10.2 percent from IDEA and 1.8 percent from Medicaid). (Center for Special Education Finance, 2004).

The smallest districts (fewer than 2,500 total students) spend 14 percent more in actual dollars, and 22 percent more in cost-adjusted dollars, to educate a special education student compared to the largest districts. The spending ratio (relative spending on the typical special versus regular education student) for the smallest districts is estimated to be 2.19, compared to an overall average spending ratio of 1.90. This difference in the spending ratios is consistent with the notion that there may be more difficulty adjusting service levels for special education students than regular education students in the smallest districts.

Districts with middle-income families spend $2,314 more per student than districts with the lowest-income families. In cost-adjusted dollars, the difference is less at $1,658. These differences are statistically and economically significant. The spending ratio is also higher for the lowest-income districts, but the difference was not statistically significant. (Center for Special Education Finance, 2002a).

Per pupil expenditures range from a low of $10,558 for students with specific learning disabilities to a high of $20,095 for students with multiple disabilities. Expenditures for students with specific learning disabilities are 1.6 times the expenditure for a regular education student, whereas expenditures for students with multiple disabilities are 3.1 times higher. Students with the two most common disabilities, specific learning disabilities and speech/language impairments, make up 46 percent and 17 percent of the students who receive special education services, respectively. Per pupil spending on these two categories are $10,558 for specific learning disabled and $10,958 for speech/language impaired. (Center for Special Education Finance, 2003b).

The total expenditure on *special* transportation services is estimated to be about $3.7 billion. This represents about 28 percent of the total transportation expenditures ($13.1 billion) in the U.S., and approximately seven percent of the total spending on special education services ($50 billion). (Center for Special Education Finance, 2002b).

During the 1999-2000 school year, the nation's school districts spent around $146.5 million on due process, mediation, and litigation activities for all K-12 special education students in public schools. Special education mediation, due process, and litigation expenditures account for 0.3 percent of total special education expenditures, approximately $24 per special education student. The expenditure per mediation or due process case ranges from $8,160 to $12,200, while the average expenditure in 1999-2000

on an open litigation case was approximately $94,600. (Center for Special Education Finance, 2003a).

Recommendations

The Abt report recommends the following priorities for special education in future years:

- Build the capacity of schools to educate students with disabilities. In particular, sustained professional development in educating students with disabilities must be delivered to general education teachers. Special education teachers, particularly at the secondary level, also need to receive training and professional development.

- • Encourage districts and schools to learn how to use accountability data on academic performance, dropout rates, and graduation rates for planning this professional development.

- Provide training to support on-going involvement of parents of children with disabilities in their children's education, and promote strategies for resolving disagreements between parents and administrators. Such tensions are potentially natural consequences of increased parental involvement.

- Make more coherent use of policy tools (e.g., issuing guidelines, allocating resources, and supporting professional development and training). While substantial progress has been made toward aligning special education policy with standards-based reform, using policy tools will decrease the number of students with disabilities who drop out of school and will foster the appropriate placement of minority special education students. (Abt Associates, 2006)

To these recommendations, we can add the following:

- Continue to explore alternative teaching strategies including universal instructional design, differentiated instruction, and response to intervention that facilitate the integration of students with disabilities into general education classrooms.

- Ensure that students with disabilities, and their parents, are aware of services available for transition to postsecondary education and the workplace, and also that they are knowledgeable about the student's rights under the ADA in the workplace and postsecondary education.

- Create and strengthen linkages between schools and adult service providers to facilitate the transition to the workplace. Every school system should have a designated transition coordinator to establish these linkages.

- Create specific policies and data collection procedures to ensure that minority students are not inappropriately classified as students with a disability and that minority students who are diagnosed with a disability are placed in the least restrictive educational environment.

- Support teacher training programs in special education to increase the availability of Highly Qualified special education teachers.

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Educating Children of Military Personnel

Steve Smith and Greta Durr

States Deploy Policies for Military-Connected Students

Nearly one million children of active-duty military personnel are currently facing family life – and education during wartime. The Military Child Education Coalition (MCEC) estimates that these children will move up to nine times at various points between kindergarten and high school graduation. Such frequent moves and school transfers often complicate student transitions to new schools and environments. This report examines policies geared to support the needs of military-connected children from early childhood education to higher education.[62]

MCEC and other organizations have been working with education leaders on the federal, state and local levels to develop and implement policies that minimize the social, academic and administrative struggles that frequently accompany military families in service to the U.S. Armed Forces.

In 1999, the U.S. Army asked MCEC to identify the barriers faced by highly-mobile students from military families in making transitions to new schools. MCEC examined nine U.S. military communities in Georgia, Kentucky, North Carolina, Oklahoma, Texas, and abroad. Approximately 30,000 children in 39 schools participated in producing the "Secondary Education Transition Study" (SETS). This report identified major problems for students and offered policy solutions in "Guiding Principals for Addressing the issues of Transitioning Military Students," a sample memorandum of agreement (MOA) crafted by participating education leaders, teachers and military commanders.[63]

Promising Practices for Mobile Students

Although SETS' recommendations initially were designed for use among state and local education authorities and military family advocates for students at the secondary education level, substantial efforts followed to identify and promote practices that advance educational opportunities for military-connected children of all ages. Since the 2001 release of the study, many states have adopted practices based on MCEC's guidance, which includes the following recommendations:

- Expand access to pre-kindergarten programs
- Improve system for timely student records transfer
- Develop systems to ease student transitions to new school environments

[62] Military Child Education Coalition. (2006). *A Legislator's Guide to Military Children*, 68. <http://www.militarychild.org/pdfs/BRLegislatorsGuide.pdf>
[63] Military Child Education Coalition. (2001) Secondary Education Transition Study. <http://www.militarychild.org/SETSSummary.asp>

- Promote access to extracurricular programs
- Foster partnerships between local military installations and schools
- Establish a system for school counselor professional development
- Improve communication on courses of study, required examinations and graduation credit options
- Minimize the adverse impact of frequent moves during the last two years of high school
- Extend higher education in-state tuition and other services[64]

MCEC suggests practices for implementation of its recommendations, and in many areas, has provided pathways for progress in meeting the needs of children from military families.

Since the 2001 release of SETS, MCEC has continued its efforts to identify challenges facing military students in transition. The organization also has stressed that policies supporting children from military families should be sure to include those who serve in the National Guard and Reserves. The National Governors Association (NGA) estimates that 43 states and territories offer targeted educational benefits to families in the National Guard and other branches of military service.[65]

In 2006, MCEC released the comprehensive "Legislator's Guide to Military Children," which expands its recommendations for supporting military-connected youth. Among the policy suggestions made in the report is allowing broader access to early childhood education programs for children from military families.

Expanded Eligibility for State-Funded Pre-Kindergarten Programs

In 2006, Texas enacted House Bill 1, legislation to expand pre-kindergarten eligibility to include three- and four-year-old children with a parent on active duty or who is serving in an activated military reserve unit. The program also included children of service personnel who have been wounded or killed in action.

This policy change opened access to 1,400 of approximately 3,000 military children in the state who previously had failed to meet program eligibility requirements. It also provides continued program access if the sponsoring parent's military status changes. Although more that 30 states expanded access or state funding for pre-kindergarten programs in 2006, Texas is the first state to specifically extend program eligibility on the basis of parental military status.[66]

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[64] *A Legislator's Guide to Military Children*, 2, 14-18, 24-31, 38-39. <http://www.militarychild.org/pdfs/BRLegislatorsGuide.pdf>

[65] National Governors Association. (2006). *State and Territorial Support for Members of the National Guard, The Reserves and Their Families*.<http://www.nga.org/Files/pdf/06guardsurvey.pdf>

[66] Pre[K]Now. (2006) Votes Count: Legislative Action on Pre-K Fiscal Year 2007, 5, 21. <http://www.preknow.org/documents/LegislativeReport_Oct2006.pdf>

Other state efforts to optimize education access and opportunity to children of military service personnel have focused on facilitating the administrative, social and emotional transitions families face as a result of their high mobility rates.

A Broad Approach to Facilitating Military Student Transitions

Often with support from the U.S. military and advocate organizations, policymakers have endeavored to develop policies that simplify processes relating to school transfers and meeting course requirements. Florida has taken a comprehensive legislative approach to meeting the needs of students from military families in transition.

A 2001 meeting between Governor Jeb Bush and local military leaders prompted the development of a working group to examine the challenges confronting military families and children transitioning into the state's schools.[67]

In 2003, the Florida legislature passed Senate Bill 2802 directing the state Department of Education to expedite the student records transfer process, develop systems to ease enrollment transitions, and to facilitate student access to extracurricular programs. Here, lawmakers required the Board to promote partnerships between the military base and the school system, and help students apply for and secure funding for post-secondary education. The legislation asked the state Department of Education to report back to the legislature on its strategies and efforts in accommodating the needs of military-connected students. Here, the state was able to define best practices tailored to fit the needs of children while working within the framework of its school system.

By providing an open and defined line of communication among lawmakers, military and school authorities, the Florida legislature has helped to mitigate problems students encountered as a result of mid-year school district enrollment, qualifying for academic and extracurricular programs and gaining access to advanced academic courses.

Beyond accepting alternative assessments for high school exit exams and graduation, Florida policy grants students from military families priority admission to special academic programs such as charter and magnet schools; Advance Placement (AP) courses, dual enrollment, and International Baccalaureate (IB) programs.

By directing the state Department of Education to work on developing agreements between school districts and military installations, the Florida legislature addressed common transition issues and ensured that children undergoing military-related transfers are not disadvantaged in the state's education system.[68]

Texas legislators took a similar approach to meeting the needs of military-connected students in 2006 with the passage of House Bill 25. The Texas mandate contains many of

[67] Military Impacted Schools Association "United we Stand…Responding to the New Military Family," 85. <http://www.militaryimpactedschoolsassociation.org/TOC.pdf>
[68] Florida Department of Education, Bureau of Instructional Support and Community Services. (2003). *Florida Military Student Education Report*. <http://www.firn.edu/doe/commhome/pdf/military.pdf>

the same provisions as the Florida legislation, but also addresses long-standing efforts to forge student records and high school exit exam reciprocity agreements with other states.

Texas Legislators Pursue Interstate Reciprocity Agreements

In 2001, the Texas Legislature passed House Bill 2125, which *allowed* the TEA to pursue student records reciprocity agreements with other states. The legislation required that such agreements should address procedures for transferring records and those for awarding academic credit for completed coursework. Under Texas Administrative Code however, such procedures are left to the discretion of each school district. TEA sent a letter to districts urging them to ensure that their local policies addressed requirements for the timely and appropriate placement of children in their districts.

In 2002, the Texas Legislature passed House Bill 591 and Senate Bill 652. Both bills *required* the TEA to pursue reciprocity agreements with other states to foster timely student records transfers. Both bills ordered the TEA to give priority to forming agreements with Florida, Georgia, North Carolina and Virginia, all states with significant military populations. TEA also was directed to report back to legislature on its progress.

House Bill 591 and Senate Bill 652 further required that the agreements address procedures for students to satisfy the state's exit-level testing requirement through the successful performance on comparable exit exams from other states. Previously, no alternatives to the state's exit exam were available to military-connected students.

In 2004, TEA reported to the legislature that it had encountered many complex challenges with providing reciprocity in state exit exams due to vast differences in standards definition, curriculum and test alignment among the various states. The Agency also stated that though Florida, Georgia and Virginia had expressed interest in entering a reciprocity agreement, North Carolina then was found to lack the authority to enter into such a compact. TEA said that local control issues likely could complicate matters for other states otherwise interested in joining an interstate reciprocity agreement.

TEA informed legislators that limiting the ability to graduate from high school using another state's exit exam would be inconsistent with a Texas Education Code requirement regarding equal educational services and opportunities and could result in litigation under the equal protection provisions in the state and federal constitutions. A TEA report suggested that a policy with broader assessment options might alleviate legal concerns associated with the exit exam requirement.[69]

In 2006, the Texas Legislature again addressed the issues of timely student record transfers and high school exit exams in House Bill 25. The legislation also directed the state education commissioner to develop rules that designate alternative nationally-recognized, norm-referenced tests that eligible students may substitute for the state exit exam. The commissioner ultimately adopted the SAT verbal, reading and mathematics

[69] Texas Education Agency. (2004). *Status Report: Reciprocity Agreements Regarding Military Personnel and Dependents.* <http://www.tea.state.tx.us/comm/reciprpt1203.pdf>

tests and the ACT English and mathematics exams, and specified passing scores for exemption from state exit exams. Also in 2006, the TEA reported that its pursuit of reciprocity agreements with Florida, Georgia, North Carolina and Virginia was an ongoing endeavor.[70]

Texans Caring for Military Children Initiative

The 2006 legislation also directed TEA to address the some of the emotional and social needs of military-connected students in transition. The Agency responded by using federal NCLB Consolidated Administration funds, to support the Texans Caring for Military Children Initiative. This program provides professional development for school counselors and others in the form of *Transition Counselor Institutes*, or seminars that focus on the social and emotional needs of military-connected children. Similar training is provided that specifically addresses the needs of children connected to the National Guard and Reserves. The initiative improves communication regarding Texas school requirements, and helps students with academic planning via the Internet and other media.[71]

Minimize the Impact of Frequent Moves for High School Students

According to the U.S. Department of Defense, a definitive set of best practices has not yet been clearly defined for uniformly ensuring smooth student transitions for, but in several states, they are emerging.[72]

Address incompatible graduation requirements

Georgia permits the state Board of Education to exempt military-connected students from the Georgia state history requirement.

High school entrance and exit exam flexibility

In Alaska, students can apply for a waiver from passing the state exit exam if they have passed another state's exit exam or if they arrive in Alaska with two or fewer semesters until high school graduation. The exit exam measures essential skills in reading, writing and math.

New Mexico has a process to accept a passing score from a state graduation test taken by a high school student in another state.

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[70] TEA. (2006). *Status Report: Transition Assistance for Military Students*. <http://www.tea.state.tx.us/comm/military.pdf>

[71] *Transition Assistance for Military Students.* <http://www.tea.state.tx.us/comm/military.pdf>

[72] U.S. Department of Defense Web site: USA4MilitaryFamilies.Org. (2007). "Military Children During School Transitions and Deployment" <http://www.usa4militaryfamilies.dod.mil/portal/page/itc/USA4/USA4_DETAIL_V2?content_id=193405>

Students who transfer from out of state to a Utah high school after the tenth grade year may be granted reciprocity for high school graduation exams they passed in other states or countries based on board of education-established criteria.

Timely student records transfers

In Maryland, a student who transfers from a nonpublic or out-of-state school is exempt from one or more of the Maryland High School Assessments if the principal awards the student credit for specified course content. Students who transfer into a Maryland high school after the first senior year semester are exempt from the state assessment requirements.

Written consent of the parent is not required as a condition of transfer in New Jersey. School districts are required to obtain proper identification of any new student, such as a certified copy of the student's birth certificate. Initial student placement is made on the basis of records. Adjustments may be made by the administration when the state-mandated assessment indicates they would benefit the student.

New Mexico schools accept hand-carried student records until the official documents are received from the student's previous school.[73]

Higher education access

Due to high mobility and deployment rates, military personnel and their families often are ineligible to claim in-state tuition at postsecondary institutions. It also is common for a military family member to enroll at a postsecondary institution as an in-state student and be forced to pay higher, out-of-state tuition costs if the family service member has a change in military assignment location.

MCEC recommends that states adopt the following practices to optimize military-connected student access to higher education opportunities:

- Provide in-state tuition for military families in their states of legal residence as well as the state of the service member's assignment.

- Allow dependents of military service personnel to continue receiving in-state tuition status if the service member relocates.

At least 46 states offer in-state tuition to military dependents and at least 30 states meet the criteria stated above. MCEC urges states to surpass these criteria by offering additional higher education resources to military-connected students.[74]

[73] OSD. (Unknown). State Education Requirements Matrix. <http://www.usa4militaryfamilies.dod.mil/portal/page/itc/USA4/USA4_DETAIL_V2?content_id=193405>
[74] *A Legislator's Guide to Military Children, 14-18.*

Creative policymaking for military-dependent student needs

Florida extends in-state tuition rates to military families who live outside of the state but on military installations that are near the state line. Florida also has extended in-state tuition to foreign military officers and their families.

Flexibility in scholarship availability

Kentucky allows students whose parents may have been called up to active service and may live with a relative outside of Kentucky during this period be able to continue to earn certain state scholarships.

Provide for children of fallen service members

Texas waives the tuition, general fees, and laboratory fees for up to 150 semester hours of study for students whose parent is killed in action, or dies while in military service, or from injuries or illness stemming from their military service. The state has also extends this benefit to the children of state National Guard members who are killed while activated.

The Florida legislature has expanded opportunities for military students pursuing higher education access and funding for dependent children of veterans who died as a result of service-connected injuries, disease, or disability. This modifies the previous policy that provided services based on wartime service injuries, disease, or disability.[75]

Conclusion

Policymakers have deployed numerous policy changes, ranging from broad legislative adoptions of MCEC recommendations in Florida and Texas to making narrow adjustments at the state, district or local levels. Such decisions often are made by school district or state education authorities. Policies that can benefit military-connected students in transition often don't specify them as a group, they may simply offer a degree of flexibility that eases the student transitions into new schools and encourages them to continue on a relatively unobstructed path to higher education, where costs can be prohibitive.

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[75] National Governors Association.(2006). *State and Territorial Support for Members of the National Guard, The Reserves and Their Families*.http://www.nga.org/Files/pdf/06guardsurvey.pdf

Redefining Best Practices in ELL Education

Steve Smith and Greta Durr

Though the requirement to provide services to ELL students emerged through a series of civil rights laws and court cases starting in the mid-1960s, major changes in state and federal requirements have altered the ELL policy landscape in the states over the past decade. Broad-based policy changes, such as the adoption of English Only education policies in Arizona and California have raised the issue's profile and prompted debate over what constitutes sound practices and procedures in providing educational services to ELL students. Perhaps most pressing to policymakers are meeting demands posed by the federal No Child Left Behind Act of 2001 (NCLB) while complying with their own state's requirements.

NCLB and ELL Education

According to the Act, federal funding is for ELL students is intended to help students develop English proficiency and meet the same academic content and academic achievement standards as other students.[76] The Act made several changes to federal policy governing ELL student education and assessment of ELL students, including the following:

- Requires annual ELL student testing in reading, writing, speaking, and listening;
- Directs that ELL students must take state achievement assessments of proficiency in meeting the state standards;
- Specifies that only ELL students in their first year of school in the United States may be exempted from taking the state reading assessment;
- Requires that academic test scores of ELL students must be reported separately from schoolwide averages, as the scores are used in determining whether a school is making adequate yearly progress (AYP) in improving the skill level of all students;
- Provides that the academic test scores of former ELL students must be tracked for two years after services are discontinued;
- Requires that ELL instruction methods must be scientifically-based and demonstrate effectiveness in increasing English proficiency and academic achievement.[77]

Both the U.S. Department of Education and state departments of education are mandated, within NCLB, to monitor and provide technical assistance to local education agencies

[76] .U.S. Department of Education, "Part I: Non-Regulatory Guidance on Implementation of Title III State Formula Grant Program," Section A-1, <http://www.ed.gov/programs/sfgp/nrgcomp.html#top>

[77] U.S. Department of Education, "Part I: Non-Regulatory Guidance on Implementation of Title III Formula Grant Program: Elementary and Secondary Education Act, Title III, Part A, as Amended by the No Child Left Behind Act of 2001," <http://www.ed.gov/print/programs/sfgp/nrgcomp.html>

that provide ELL student services. Beyond NCLB requirements, the federal Office for Civil Rights (OCR) is charged with monitoring school district compliance with the 1964 Civil Rights Act. Although the OCR does not prescribe a specific program or ELL students, it does require programs to be effective, and require that they adhere to the following:

- Properly identify students who need language services.
- Develop programs that are effective in promoting learning.
- Provide adequate teachers, educational materials and physical space.
- Adequately evaluate student progress.
- Evaluate the entire program on an ongoing basis and implement changes when and where they are needed.[78]

The NCLB requirement that education research must be scientifically based has rendered much of the research on ELL education that was performed before the Act, much less useful to policymakers seeking to comply with federal requirements.

This report examines how policymakers in two states with vastly different approaches to ELL education are approaching similar obstacles in closing their ELL achievement gaps and redefining best practices to build cost-effective programs that meet the mandates and the needs of this student population.

Washington Legislators Evaluate State ELL System

In 2004, the Washington Legislature directed the Washington State Institute for Public Policy (WSIPP) to review the state-mandated Transitional Bilingual Instructional Program (TBIP) for public schools. State law authorizes bilingual, or native language instructional programs and allows for ESL when native language instruction is not feasible. The state also gives school districts broad discretion to select and implement programs on an as-needed basis. The state Office of the Superintendent of Public Instruction (OSPI) develops policy guidelines for best practices, and provides training and technical assistance to schools enrolling TBIP, or ELL students.

ELL student enrollment growth

Between 1985 and 2004, ELL student enrollment in Washington's K-12 public schools rose from 2 percent to 7 percent. As ELL student enrollment in the increased, so has the need for dedicated general fund expenditures. The state spends an estimated $54 million annually on services for approximately 70,000 ELL students, according to the WSIPP report "English Language Learners in K-12: Trends, Policies and Research in Washington State," which was issued in 2005. WSIPP attributes enrollment increases to ELL student population growth and the amount of time students spend in the state's ELL program

[78] U.S. Department of Education: Office for Civil Rights, <http://www.ed.gov/about/offices/list/ocr/ell/december3.html>

ELL services provided
While Washington created its Transitional Bilingual Education program in the late 1970s, WSIPP says that most Washington schools currently provide ESL instruction for ELL students, especially at the middle and high school levels.

Bilingual instruction in the state is more common among elementary school students because more of the state's ELL students are in that age group (65 percent) and also because they remain in the same classroom for most of the school day.

Because of their instructional nature, Bilingual programs require enrollment of sufficient numbers of ELL students in the same grades, who speak a common native language, and who are learning at similar levels of language proficiency. While 66 percent of ELL students speak Spanish, WSIPP reports that more than 160 different languages are spoken in Washington schools.

ELL student program length
WSIPP says that, while there is no clear consensus in the research literature, many researchers have concluded it can take between four and seven years for ELL students to attain English language proficiency sufficient for academic work. Among the states, the Institute found that ELL students' average length of stay in programs depends on program design and student performance on assessments. Researchers noted that a lack of data make it difficult to track program successes and failures in the state.

In Washington, state law sets a target for student ELL program participation at three years. Students who need additional instruction to pass assessments however, may stay in the program longer. WSIPP data show an increase in the percentage of students who stay in the state's ELL program for more than three years, from 10 percent in 1987 to nearly 30 percent in 2002. Overall, ELL student time spent in the program has grown over the past 20 years from 1.4 to 2.2 school years.

Washington's ELL achievement gap
Data on Washington's ELL student outcomes reveal an academic performance gap between ELL students and the state's overall population of K–12 students overall. WSIPP researchers say that this disparity is found nationwide. In fact, 20 percent to 55 percent fewer Washington ELL students meet state standards than the state's general student population.

The study notes that useful analysis of district-level data is limited and said that an impending change in OSPI ELL data collection procedures is likely to enrich future research on instructional strategies associated with improved academic outcomes for ELL students. Under the old system, analysis of district-level data could not conclusively link the amount of time students spend in ELL education with program success, or improved student outcomes.

Rating the research
In attempts to identify practices associated with ELL student success, WSIPP says that a comprehensive review of relevant research literature reveals that few ELL program evaluations use sufficiently rigorous research designs to meet standards that constitute that the work is scientifically based. Analysts note that there is some evidence that bilingual programs can improve ELL student test scores in the short term, and that much of the most useful best research does not address ESL instruction.

In the end, WSIPP recommend that the state should use new OSPI data to study program cost-effectiveness. Analysts say that his investment in research would provide scientific evidence of what instructional strategies work best for Washington's unique system of ELL education and promote the identification of successful practices.[79]

Legislators Seek Best Practices in California
Roughly one in four children in California's public K-12 system is classified as an ELL student, defined in statute as "a child who does not speak English or whose native language is not English and who is not currently able to perform ordinary classroom work in English." According to a 2007 California Legislative Analyst's Office (LAO) report, a significant performance gap exists between ELL and English-speaking students. Analysts say the state faces considerable challenges in closing this gap and addressing the needs of its 1.6 million ELL students.

State estimates indicate that 60 percent of California's ELL students are in elementary school, while 20 percent are in middle, and high school. Based on participation in California's free and reduced price meal program, approximately 85 percent of the state's ELL students are economically disadvantaged, compared to 41 percent of the non-ELL population. Students identified as both ELL and economically disadvantaged typically earn lower scores on state assessments than students identified with only one of those risk factors.

California's ELL achievement gap
Closing the achievement gap between ELL students and their English-speaking peers poses a significant challenge to California. According to LAO, the state already is spending approximately 13 percent more on its ELL services than other states. Analysts say that once best practices in meeting the needs of California's ELL students are identified, legislators can make informed decisions in crafting policies and funding mechanisms that support these practices. From there, local educators can build their efforts upon a successful model.

LAO says that more information on what *is* working for California's ELL students is needed to help policymakers at the state and local levels make better-informed decisions. Because examination of best practices is based on the assumption that educators can discern what approaches are effective because they yield the desired results. Because, the ability to measure success — and failure in ELL education is essential to improving

[79] Washington State Institute for Public Policy. (2005). *English Language Learners in K-12: Trends, Policies and Research in Washington State.*<http://www.wsipp.wa.gov/pub.asp?docid=05-01-2201>

student educational outcomes, LAO has urged the state to develop the capacity to develop a system to measure ELL student progress across years.

Systematic reforms needed
Some of LAO's recommendations to state legislators include the following:

- Fund evaluations to identify effective practices and upgrade the state assessment system to better measure ELL student progress
- Adopt a more strategic approach to ELL funding
- Couple funding reform efforts with accountability reform.
- Fund an evaluation of the recently established best practices study group to identify effective approaches to educating ELL students.
- Identify how successful districts use instructional materials for ELL students.
- fund a separate evaluation to identify effective approaches to ELL teacher preparation Assess the effectiveness of common ell teacher professional development programs
- Require state assessments to be vertically scaled so ELL student progress can be measured. [80]

Compliance with federal and state mandates
In addition to meeting federal requirements for ELL education, California has a unique set of state ELL education requirements stemming from an English Only ELL education policy. In 1998, California voters approved Proposition 227. The measure requires California public schools to teach ELL students "overwhelmingly in English" in special classes that are conducted in English using Sheltered Immersion techniques that the federal National Clearinghouse for English Language Acquisition and Language Instruction Educational Programs (NCELA) currently classifies as a form of ESL instruction. Though not all ESL programs specify a time limit for English language acquisition, the measure calls for ELL students to be removed from Sheltered Immersion classes and routed, or "redesignated" into mainstream classes within a year. Proposition 287 also restricts the use of Bilingual Education programs and materials which previously had operated without specifying a time limit on student participation. The measure does allow parents to sign a waiver to allow students access to programs other than the specified Sheltered Immersion program.

In 2000, under the direction of state legislators, the California Department of Education (CDE) contracted with the American Institutes for Research (AIR) and WestEd to conduct a five-year, legislatively mandated evaluation of the effects of Proposition 227 on ELL education in the state. To perform the study, researchers used a mix of student achievement analyses, phone interviews, case study site visits, and written surveys, all used to examine how the measure was implemented, which ELL services are effective, and what unintended consequences may have resulted from the implementation of Proposition 227.

[80] California Legislative Analyst's Office. (2007). *Education: 2007-2008 Analysis*, 121-143. <http://www.lao.ca.gov/analysis_2007/education/ed_anl07.pdf>

Promoting success in California's ELL system

Among the key observations researchers made during the course of the lengthy study is that student data are critical to effectively documenting best practices and promoting the viability of their widespread adoption. Well-documented best practices with regard to improving ELL student learning through assessment include regular review of assessment data to monitor teaching and learning, as well as adjusting instructional planning based on student performance. In the context of ELL instruction, assessment can be particularly important for gauging progress in English acquisition, as well as in academics.

Beyond the issue of data collection, research in the report indicates that, while there is no singular method that uniformly promotes academic excellence among ELL students, there are several factors that can play a vital role in fostering successful outcomes. School administrators identified the following as critical components to reaching program goals:

- Providing adequate staff capacity to address ELL needs;
- Focusing on schoolwide English language skills development and standards-based instruction techniques;
- Sharing priorities and expectations for ELL education;
- Using and applying systematic, ongoing assessments and data-driven decision-making techniques.

The final report, "Effects of the Implementation of Proposition 227 on the Education of English Language Learners, K-12," was released in 2006. Some key study recommendations include:

- Identify successful programs and create opportunities for successful schools and districts to share their practices with peers.
- Focus monitoring efforts to ensure that a student's language status does not impede full, comprehensible access to core curriculum.
- Limit prolonged separation of ELL students from English-speaking students.
- Specify clear performance standards for key statewide measures of ELL student progress and achievement.
- Foster better data collection and use practices to guide ELL policy and instruction.
- Require school district leaders to clearly articulate their ELL instruction across classes within grades, across grades within schools, and across schools within the district.
- Allocate resources to support teacher professional development in the skills necessary to promote English language and academic proficiency.
- Ensure that fully certified teachers are assigned to the schools where they are most needed.
- Acknowledge the added learning expectations and demands placed on ELL students by providing equitable funding support

- Continue funding community based English tutoring programs.[81]

Legislation to redefine best practices

Efforts of a legislative study group led to the creation of legislation to define best practices for California's ELL program. Assembly Bill 2117 of 2006.calls for a three-year, best practices study of what works improves educational outcomes for ELL students. More than 25,000 students are slated for inclusion in the study which also contains a competitive grant process to be directed by a statewide advisory committee and administered by the CDE. Under this legislation, grants will be distributed among K-12 schools throughout the state, and evaluated through a design funded by the William and Flora Hewlett Foundation. Study data will then be collected and substantiated as best practices in ELL education.[82]

Conclusion

States are struggling to provide ELL services to a burgeoning population of students with limited budgets. In many cases, it is likely that programs constructed to meet the requirements imposed by federal civil rights legislation and pivotal court cases over the past 40 years are outdated, especially in view of NCLB's mandates addressing ELL student achievement.

Rather than looking to the past to define best practices in ELL education and program administration, states should consider evaluating how their current systems are functioning towards meeting future goals, which are likely to start with enhanced systems to collect and track ELL student progress. Only from that point can policymakers truly make informed decisions regarding how precious funding should be spent to close ELL achievement gaps and promote better educational outcomes.

Sidebar: A Rhode Island ELL Snapshot

States and school districts commonly use a variety of methods for ELL education. Types of ELL approaches may generally be divided in to two broad categories of instruction: bilingual education and English as a Second Language (ESL). The former usually includes some form of instruction in the student's native language, while the latter uses English as the primary language of instruction.

In Rhode Island, the ELL student population decreased from 8,925 students in 2004 to 8,180 students in 2005. Sixty percent of Rhode Island's estimated 8,000 ELL students are in elementary school. Approximately 80 percent of the state's ELL students live in Providence, and as many are from low-income, Spanish-speaking families.[83]

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[81] American Institutes for Research (AIR) and WestEd. (2006). *Effects of the Implementation of Proposition 227 on the Education of English Learners, K-12*, vii-xiv. <http://www.wested.org/cs/we/view/rs/804>

[82] California General Assembly. "Assembly Bill 2117 of 2006". <http://info.sen.ca.gov/pub/05-06/bill/asm/ab_2101-2150/ab_2117_bill_20060928_chaptered.html>

[83] 2006 Rhode Island Kids Count Education Factbook, 122. <http://www.rikidscount.org/matriarch/documents/indicator51.pdf>

General Accounting Office (GAO) information regarding the types of ELL instruction that receive Title III funding in Rhode Island appears below, along with descriptions of other types of instruction discussed in this report. Information also is provided regarding how many states (including the District of Columbia and Puerto Rico) use they types of instruction discussed.

ELL education modes of instruction
Bilingual education generally includes dual language programs, transitional bilingual education, and developmental bilingual education, while ESL-based programs include heritage language instruction, sheltered English instruction, sheltered English immersion, specially designed academic instruction in English, Content-based ESL, and Pull-out ESL. Brief descriptions of these program types and the number of states that use them are provided below. The U.S. General Accounting Office (GAO) reports that Rhode Island uses Title III funds for both types of instruction.

Bilingual education:
Used in 40 states
Two languages are used to provide content matter instruction.

Dual language program:
Used in 47 states, including Rhode Island
Also known as two-way immersion or two-way bilingual education, these programs are designed to serve both language minority and language majority students concurrently. Two language groups are put together and instruction is delivered through both languages to encourage language acquisition for both groups of students.

Transitional bilingual education:
Used in 31 states, including Rhode Island
Subjects are taught through two languages—English and the native language of the ELL—and English is taught as a second language. English language skills, grade promotion, and graduation requirements are emphasized, and the native language is used as a tool to learn content.

English as a second language (ESL):
Used in 52 states
Instruction is based on a special curriculum that typically involves little or no use of the native language. ESL focuses on English (as opposed to content), and is usually taught during specific school periods.

Sheltered English instruction:
Used in 45 states, including Rhode Island
This approach is designed make instruction in English understandable to ELL students and to promote English and content area proficiency. It differs from ESL in that English is not taught as a language with a focus on learning the language. Here, the emphasis is on content knowledge and skills.

Structured English immersion:
Used in 35 states
In this type of program, language minority students receive all of their subject matter instruction in English.

Specially designed academic instruction in English:
Used in 17 states, including Rhode Island
Delivered in English, this is a program of instruction in a subject area that is designed to provide ELL students with curriculum access.

Pull-out ESL:
Used in 41 states, including Rhode Island
Here, students with limited English proficiency are removed from regular, mainstream classrooms for ESL instruction.[84]

[84] U.S. Government Accountability Office. (2006). *No Child Left Behind Act: Education's Data Improvements Could Strengthen the Basis for Distributing Title III Funds*, 32, 37, 47. <http://www.gao.gov/new.items/d07140.pdf>

Innovative State Programs Target At-Risk Youth for Brighter Futures

Greta Durr and Steve Smith

Following the standards-based reforms of the 1990s has been a major state legislative policy trend in providing innovative educational programs to help at-risk children overcome obstacles to academic success before they become insurmountable. This report examines how some states are changing methods used to identify children at-risk of education failure and building on strategies to mitigate risk factors. It also explores recent state legislation to promote early childhood education, improve academic performance, and reduce dropout rates.

Students at risk of academic failure are most commonly identified as those who qualify for the free and reduced-price meal programs that are defined by the U.S. Department of Agriculture and based on household income. While poverty in the home plays a central role in identifying children who are at risk of academic failure, policymakers are considering additional attributes of a child's home life in crafting policies that reach children early in life and try to keep them in school later on.

Risk Factors Revision

Annie E. Casey Foundation (AECF) research has shown that other factors contribute greatly to the successful identification of children who are at high risk for academic failure. In 1999, AECF developed a Family Risk Index that identifies a "high-risk child" as one who lives in a family with four or more of the following characteristics:

- Child is not living with two parents;
- Household head is high school dropout;
- Family income is below the poverty line;
- Child is living with parent(s) who is underemployed;
- Family is receiving welfare benefits;
- Child does not have health insurance.

While overall national estimates of high-risk children fell during the 1990s, seven states and the District of Columbia showed considerable growth in the high-risk category. According to AECF, Rhode Island showed a 60 percent increase, followed by Hawaii, Oregon, Utah, North Dakota, Washington, and Delaware.[85]

How Risk Factors Affect Children

Home, community, and school risk factors are interconnected and negatively affect outcomes for at-risk youth. Children in poverty often have less verbal interaction with their parents and enter school systems with lower-than-average vocabularies. Once in

[85] Annie E. Casey Foundation. (2000). "New Report Charts Drop in At Risk Kids in U.S.". <http://www.aecf.org/kidscount/highrisk_press.htm>

school, increased demands for verbal and social skills can intimidate children and contribute to low self esteem, behavioral problems and poor academic achievement.[86]

Promote Brighter Futures for At-Risk Youth
The U.S. Department of Education has identified several effective strategies to improve educational outcomes for at-risk youth. Some recommendations to policymakers include:

- Provide access to early childhood education;
- Offer tutoring [via afterschool, or extended-day programs];
- Evaluate policies for success in dropout reclamation and prevention;
- Promote career education and workforce readiness.[87]

Issues of growing interest to legislators have been creating and extending access to pre-kindergarten and afterschool programs and developing a range of innovative approaches drop-out intervention and prevention.

Early Childhood Education Programs Flourish
Currently, 40 states fund pre-kindergarten programs. Most states currently offer services to a limited number of children who have identified risk factors such as poverty, low parental education, teen parents and English as a second language. Florida, Georgia, and Oklahoma however, provide pre-kindergarten for all four year olds.[88]

Kansas Takes a Creative Approach to Pre-K Pilot Funding
States use many strategies to launch publicly funded pre-kindergarten systems and to ensure the programs are effective, efficient, and accountable. One reliable approach to ensuring pre-kindergarten program success is via the establishment of a pilot program.

In 2006 Kansas, legislators approved a one-year preschool pilot program in six counties that is funded with $2 million in tobacco settlement funds. This policy was designed to invigorate a small program for at-risk children that offered services with lower quality standards and served fewer than 20 percent of four year olds.

The new program sets quality standards by establishing qualification requirements and low teacher-to-child ratios.[89]

Illinois Takes Stock in Early Childhood Education
In 2006, Illinois legislators moved to phase in voluntary pre-kindergarten for all children. With this legislation, Illinois became the first state to commit to providing universal

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[86] The National Center on Education, Disability and Juvenile Justice. (Unknown). "Prevention: Home, Community, and School Connections". <http://www.edjj.org/focus/prevention/phcsc.html>
[87] U.S. Department of Education. (2005). "Dropout Prevention Program Recognition Initiative". <http://www.ed.gov/programs/dropout/dropoutprogram.html>
[88] Clothier and Poppe, "Pre-School Rocks". *State Legislatures*. (January, 2007).. <http://www.ncsl.org/programs/pubs/slmag/2007/07SLJan07_Preschool.pdf>
[89] Pre[K]Now. (2006) Votes Count: Legislative Action on Pre-K Fiscal Year 2007, 5, 21. <http://www.preknow.org/documents/LegislativeReport_Oct2006.pdf>

preschool for 3- and 4-year-olds. Under the new policy, funding will increase over five years.

Behind the legislation is an effort that began in 2003 when, through the enactment of Senate Bill 565, the governor and the Legislature established an Early Learning Council to perform the following functions toward the goal of providing high quality pre-kindergarten programs in the state.

- Review recommendations of other early childhood efforts and initiatives and oversee implementation
- Develop multi-year plans to expand programs and services to address insufficient capacity and to ensure quality
- Reduce or eliminate policy, regulatory and funding barriers
- Engage in collaborative planning, coordination and linkages across programs, divisions and agencies at the state level
- Report to the governor and General Assembly on progress toward goals and objectives on an annual basis.[90]

The Illinois Legislature passed Senate Bill 1497 in 2006 based on the Council's recommendations. The new law defines "at-risk" children as those who are identified through a screening process based home and community environments that are subject to language, cultural, economic and like disadvantages. The legislation specifies that first-priority for funding new preschool programs must be given to those serving at-risk children and second priority for funding will be awarded to programs serving children with a family income of less than four times the federal poverty level.[91]

Broad Support for California Tutoring and Extended Day Programs

California policymakers and voters have demonstrated strong support in recent years for the state's extended-day, or afterschool program. Proposition 49, a citizen initiative written and sponsored by Governor Arnold Schwarzenegger, passed in California's 2002 general election with 55 percent of the popular vote. The measure created the After School Education and Safety Program Act of 2002 (ASESP), replacing an earlier program without making major operational changes.

Proposition 49 earmarks up to $550 million in universal after school incentive grants for all public elementary, middle and junior high schools, including charter schools. The measure specifies that funding beyond $85 million can only be accessed under certain improved state economic circumstances, and grants the General Assembly the authority to amend program specifics.[92]

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[90] Office of Governor Rod Blagojevich: "Illinois Early Learning Council" <http://www.illinois.gov/gov/elc/>

[91] Illinois Legislature. "Senate Bill 1497 of 2006". <http://www.ilga.gov/legislation/publicacts/94/PDF/094-1054.pdf>

[92] National Conference of State Legislatures. (unknown). "Proposition 49 Passes". <http://www.ncsl.org/programs/cyf/prop49.htm>

Due to California's continuing economic recovery, 2006 is the first year since its passage that $550 million in Proposition 49 grant funds will be available to districts throughout the state. Schools are eligible for grants to fund programs that provide students with tutoring in subjects such as computer training, English Language skills, homework assistance and physical fitness.

Under the policy, elementary schools are eligible for grants up to $112,500 and middle schools are eligible for grants up to $150,000. These additional funds allow school districts and schools to keep their doors open after school hours, inviting students to participate in programs throughout the school week and year.[93]

In 2006, legislators approved Senate Bill 638, which simplifies the Proposition 49-established grant process and makes it easier for schools to obtain available funds. The legislation provides that tutoring should be provided to help students pass the state's high school exit exam.[94]

Illinois Legislators Spark Dropout Prevention Task Force
In addition to state efforts to mitigate risk factors for academic failure through the expansion of its pre-kindergarten program, Illinois legislators have committed to reclaiming its students who have dropped out of school.

Reclaiming Dropouts in Illinois
In 2000, AECF estimated that 27 percent of the 16-to-19-year-olds in the nationwide high-risk category were high school dropouts; teens not in the high-risk category showed a 7 percent dropout rate.[95] AECF data for 2005 indicate that the Illinois student dropout rate also is 7 percent.[96]

In adopting House Joint Resolution 87 in 2006, Illinois legislators created the *Task Force on Re-enrolling Students Who Dropped Out Of School.* Under the direction of the Illinois Board of Education, the task force is charged with researching policies, programs, and other issues to help develop best practices to keep at-risk youth in school.[97]

Louisiana Innovations in Career Education and Facilities Use
Toward the stated goal of preparing at-risk youth to meet the demands of the modern work force, the Louisiana Legislature passed Senate Bill 749 in 2006. The legislation

[93] California Office of the Governor Press Release. (2006). "Governor Schwarzenegger Promotes California's Historic Expansion of Afterschool Programs" <http://gov.ca.gov/index.php?/press-release/4435/>
[94] California General Assembly. (2006). "Senate Bill 638 of 2005". <http://www.assembly.ca.gov/acs/acsframeset2text.htm>
[95] Annie E. Casey Foundation. (2005).Kids Count Indicator Brief: Reducing the High School Dropout Rate,) 8. <http://www.aecf.org/kidscount/sld/auxiliary/briefs/hsdropoutsupdated.pdf>
[96] Annie E. Casey Foundation. *Kids Count*. (2006). State-Level Data Online <http://www.aecf.org/kidscount/sld/profile_results.jsp?r=15&d=1>
[97] Illinois Legislature. (2006.) "House Joint Resolution 87". <http://www.ilga.gov/legislation/94/HJR/PDF/09400HJ0087lv.pdf>

creates reciprocal technical training programs among high schools, technical colleges and community to serve would-be dropouts.

Under the resolution, the Board of Supervisors of Community and Technical Colleges and the Board of Elementary and Secondary Education are required to work together to improve career and technical pathways between high schools and community and technical colleges, The program will be phased-in, starting with the 2007 school year, and requires that services must be available to all students by 2011.[98]

Conclusion

There are myriad opportunities for legislators play a pivotal role in improving educational opportunities for youth at-risk of academic failure. By crafting policies and programs that support at-risk youth, policymakers can provide children with much-needed survival skills as they head into schools, and the workforce.

[98] Louisiana State Senate. (2006). "2006 Regular Session Highlights". <http://senate.legis.state.la.us/sessioninfo/2006/RS/Highlights/LinkShell.asp?s=PostsecondaryEdu>

The Elements of an Education Finance Distribution Formula for the State of Rhode Island

The elements of a successful state education finance distribution formula are multifaceted. Every state aid education finance formula involves a multitude of judgments and public policy considerations. It is also noted that all formulas can be improved over time and that all formulas must be adjusted as we advance knowledge and make technical adjustments as well as the realities of the ever changing nature of determining public policy regarding the financing of public elementary and secondary education. This section of the report outlines the elements that R. C. Wood & Associates would suggest that would enhance both the equity and the adequacy of financing public elementary and secondary education for the state of Rhode Island.

It is important to note that this section of the report is offered as an overall concept in terms of guidance as outlined in the response to the request for proposal. It is not a specific proposal beyond the confines of the contractual tasks between the state of Rhode Island and R. C. Wood & Associates.

It is the recommendation of R. C. Wood & Associates that the state of Rhode Island move from an appropriation based financial distribution methodology to a student needs based driven formula. The student needs based formula should be phased in as rapidly as possible. During the phase in all districts would receive the greater of the previous appropriation or the formula generated amount. Thus, as school districts move to the new formula greater equity and adequacy will occur. Once a school district elects the new formula it would not be able to revert to the previous system.

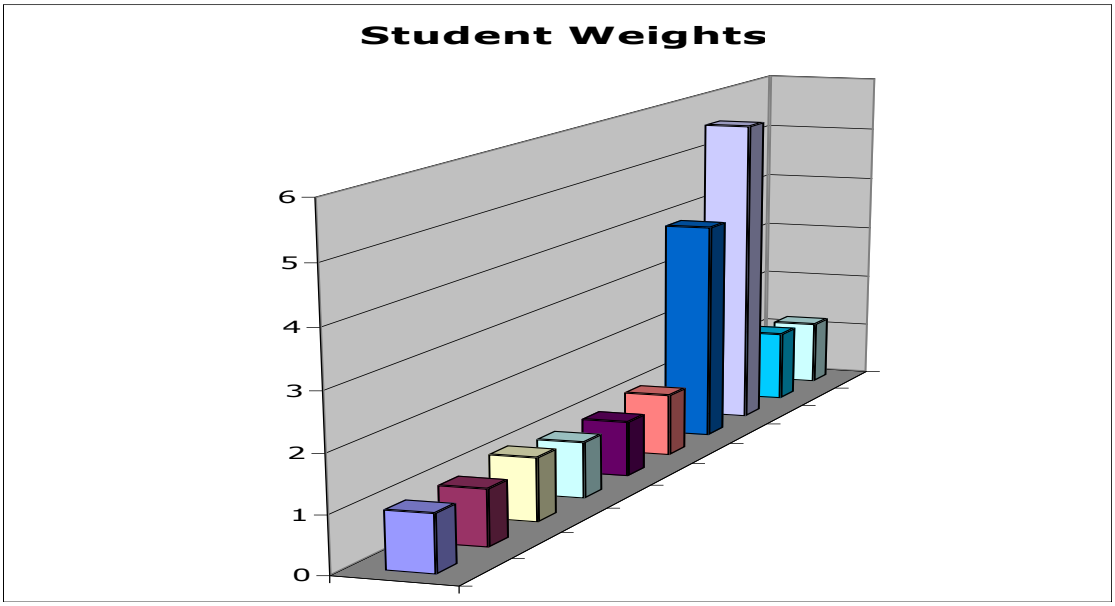
By engaging in this overall recommendation, the state of Rhode Island, over time, will have a education finance distribution system that is student needs driven and will increase the equity and adequacy for public education in the state. Additionally, as a public policy, school districts as well as local communities will be able to better plan for educational expenditures. Overall, the state legislature will be able to engage in more consistent, defensible, and sound public policy to serve the people of Rhode Island.

The equity of the system would be enhanced in that the differences in per pupil spending would be essentially within a narrow band of expenditures. Those expenditures outside of this band would be for legitimate student need based expenditures. The base per pupil expenditure would be largely determined by the expenditures generated by this initial study performed by R. C. Wood & Associates. The weights for the initial conceptual formula should embrace three major student groups as follows:

- Students in Poverty,
- Students in English Language Programs, and
- Students in Special Educational Programs.

An example of one state legislative weighted formula is shown as follows. In this particular example, the state legislature has designed weights grades as well as for special needs students. This is shown for illustrative purposes only. It reflects what one state legislature utilized within the last several years. In this illustration, it is important to note that each actual weight will change every year as well as the base student allocation to generate the amount equal to 1.000.

Student Weights/Programs	Weights
Grades K, 1, 2, 3	1.012
Grades 4-5-6-7-8	1.000
Grades 9-10-11-12	1.132
Special Education Support Level 4	3.948
Special Education Support Level 5	5.591
English Speakers of Other Languages	1.302
Programs for grades 9-10-11-12 Vocational Education [In this instance, weights are determined by utilizing a rolling 3 yr average of actual school district expenses per child	1.187



Graphic Display of Example Weights

Thus, the formula would be based on sound judgment as within the purview of the state legislature and other elected public policy makers. These decision makers would, in a

structured and systematic manner, evaluate the various aspects of the formula every legislative session. In this manner, the various components of the formula would be brought up to date, respond to public concerns, and be adjusted for better data, changing needs, and student demographics. Additionally, an overall consideration would be the fiscal ability of the state legislature to make reasonable appropriations to fund the formula.

The concepts of such a formula are outlined and discussed herein. It is also important to note that each conceptual component of the formula will be subject to certain debate and disagreement as each component will assist/deter individual interests/districts. Regardless of these discussions, the overriding issue should be for the state of Rhode Island to meets its obligations and assure that all school children receive an equitable and adequate education. The most important concept is to have the basic structure of the overall distribution formula placed into legislation and operation. Specific components can be added/deleted over time and analyzed as to the positive/negative impact on the state. As suggested earlier, it is also the recommendation of R. C. Wood & Associates that the state education finance student needs based distribution formula be phased in over time. That is, once the total amount of expenditures are determined by the formula each school district may continue to operate under the previous amount of expenditures until which time the school district decides to come under the new formula. It is also critical to note that once a school district comes under the new formula it may not return to the "old" expenditures procedures and formula. Thus, it would be anticipated that no school district would be harmed and would transcend to the new formula in a manner that would be locally determined.

Additionally, for the purposes of property tax relief as well as improving statistical equity, the local share could be curtailed/retarded over time. While this will, over time, improve horizontal equity it is important to acknowledge that any local share retardation is predicated on the state assuming a greater cost toward funding the adequacy levels as identified in this analysis.

This concept is to be fully noted in that since the state, at present, tends to operate under an appropriation concept as opposed to a finance formula; the state is not really transcending from one formula to a new formula but rather from an appropriations and expenditure pattern to a new student needs driven education finance distribution formula. Thus, it is recommended that the transition be from this expenditure pattern basis to the new education finance distribution formula.

The concept of the state education finance formula would be to offer every public school elementary and secondary student the availability of programs and services appropriate to his or her educational needs which are substantially equal to those available to any similar student notwithstanding geographic differences and varying local economic factors throughout the state of Rhode Island.

The overriding concept of any new formula would be that the state of Rhode Island establish a student need driven formula reflecting the determination of the adequacy and

equity levels reflective of state policies as established by the state legislature. Certain students would receive additional weights and be in districts that would also receive certain additional revenues due to formula cost of living adjustments and levels of poverty.

For purposes of this report the formula is constrained to the direct instructional activities of school districts. It is the recommendation of R. C. Wood & Associates that separate formulas need to be established for the following educational activities:

- Student transportation,
- Technology,
- School food service, and
- Capital outlay and maintenance.

In order for a school district to participate in the state education finance distributional formula the local community must raise the required taxes. The local effort should reflect the state policy objectives of relying less on the local property tax. However, over time, this state policy is predicated on the state assuming a growing share of the cost of a student needs driven formula. The Legislature may allow for narrow discretionary tax rates by voter approval depending upon the types and tiers of school districts.

The state legislature should establish the public policy as to determining the manner of local wealth. This could be the total of the assessed valuation, the total of local income, or the total of sales tax revenue generated. If possible, the most specific determination would be a combination of these three elements. Again, this element could be phased in over a period of time and allow school districts to transcend from the appropriation process to the student need formula based concept. The basis of determination of local wealth should be consistent, e.g., the relationship of assessed value to retail value of all taxable property of the school district. The state legislature should determine the public policy of deciding the exact measure of revenues. It is technically possible for the education finance distribution formula to factor the state public policy for measuring the local ability to meet the needs of the student need driven formula. R. C. Wood & Associates is able to make recommendations for legislative examination at some point in the future.

The legislature should consider a maximum and a minimum percentage of the overall state aid that each school district is guaranteed. For example, all school districts would be subject to a maximum of 90 percent state aid with a maximum of 10 percent state fiscal assistance regardless of wealth. Again, these figures are public policy judgments best determined by the legislature and the costs associated with each policy decision. The percentage of guaranteed should only affect very few of the school districts and would be modeled on various projections.

Additionally, the legislature should consider the formation of options school districts. That is, the allowance of school districts to enter into an agreement with the state legislature that as long as each school within the district meets all state achievement

levels and foregoes any state aid the school district would be allowed to be exempt from all state rules and regulations. Thus, very wealthy high-socio-economic school districts would be allowed to compete with private schools on an equal footing. The local voters must be able to approve the budget under these arrangements. These agreements are designed to exist for a specified number of years with either party being able to non renew the agreement. Again, this concept emerges from best practice and is reflective of our design for the state of Missouri.

The formula would be based on sound judgment as within the purview of the state legislature and other elected public policy makers. The Legislature could, in a structured and systematic manner, evaluate the various aspects of the formula on a periodic basis.

Specifically, various components of the formula would be brought up to date, respond to public concerns, and be adjusted for changing needs and student demographics in a systematic manner.

The overall consideration would be the fiscal ability of the state legislature to fund the formula every legislative session.

The concept is to have the basic structure of the formula placed into legislation. Specific components can be added/deleted and analyzed over time.

The intent of this study was to determine the actual costs of providing an adequate education in the state of Rhode Island. The methodologies, as discussed and implemented, and the resultant targeted expenditures would drive the actual base student allocation for the policy makers. The state of Rhode Island would determine these expenditures in order to assure all school districts will have an adequate fiscal amount to provide instructional services.

Program cost factors would for the basis of expenditures on a per student basis. For purposes of this report and examination the program cost factors would be the assigned weights. As previously discussed, the three primary weights would be students in poverty, English language learners, and special education. The actual weighs should be determined by the:

- Data contained within this study,
- Best practices as identified by state legislative actions,
- Evaluations of initiatives as determined by the Rhode Island legislature, and
- Some combination thereof.

As a state aid distribution formula the process would be as follows:

AVERAGE STUDENT COUNT[99] WOULD BE MULTIPLIED BY THE VARIOUS ASSIGNED STUDENT WEIGHTS

THE RESULT WOULD BE A WEIGHTED AVERAGE STUDENT COUNT (WASC)

THE WASC WOULD THEN BE MULTIPLIED BY THE STATE OF RHODE ISLAND ADEQUACY TARGET

THIS PRODUCT WOULD THEN BE MULTIPLIED BY A COST OF EDUCATION INDEX

THE LOCAL EFFORT WOULD THEN BE SUBTRACTED FROM THIS OVERALL EXPENDITURE FIGURE

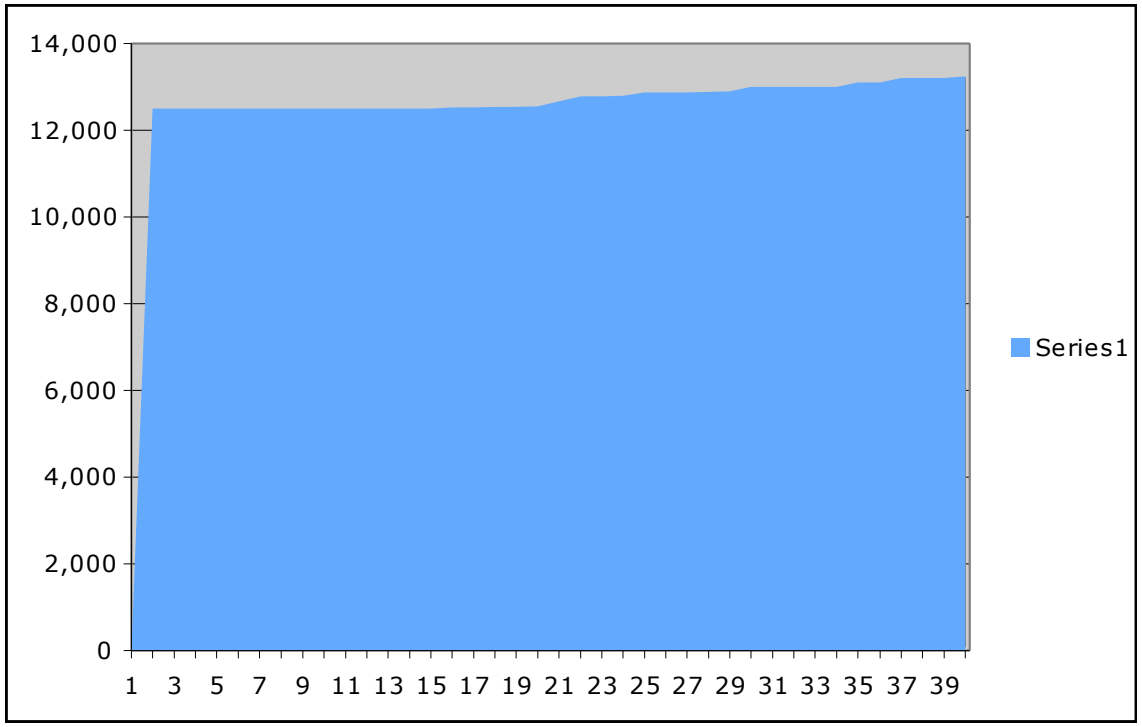
THE BALANCE WOULD THEN EQUAL STATE FUNDING

The goal of such a state education finance distribution formula, with all of the vertical and horizontal equity and adequacy adjustments is to bring the expenditure pattern, on a per pupil basis, into an acceptable public policy. Any differences of expenditure patterns should be a reflection of legitimate student variables, i.e., vertical equity adjustments. The following illustration would be a graphic overview after the various adjustments.

This illustration is offered as simply a graphic display as to the goals of a state education finance distribution formula. Until the state legislature determines the adequacy target as being informed by this study the numbers utilized in this example are only for illustration purposes and are not indicative of the public policies that should be engaged.

[99] The term average student count simply reflects some manner an average daily membership, average daily attendance, or some manner between the two. The actual mechanics would be determined, based on data as reflected in the creation of the finance distribution formula.

An Example of Expenditures Per Pupil Goals by School District



Additionally, several formulas should be created for the purposes of funding:

- Capital Outlay/Maintenance/Repair & Renovation of Educational Facilities,
- Transportation, and
- Technology.

Each of these formulas should operate independently and be designed to assure the specific purposes for which they are created in funding the objectives in an equitable and adequate manner. For example, a transportation formula would account for how many pupils are transported per mile, the cost of fuel, depreciation, and maintenance in relationship to the wealth of the school district. This is distinctly different than the previous formula as outlined for the educational expenditures of the state and local schooled districts. Capital outlay would-be a function of the age, condition, and educational facility needs. Additionally, factors could be designed for efficiency and public utilization of educational facilities.

The formula would be modeled to account for various assumptions/desires/policies that could be examined by the state legislature. Thus, every school district would be projected as to the expenditure patter, local effort, and the state share.

The legislature will make a key determination as to the model it wishes to embrace in determining the targeted expenditures to offer an adequate and equitable education to the school children of the state of Rhode Island. As developed within this analysis, the Legislature may choose to embrace any of the various methodologies, or combinations thereof, as presented within this study in order to justify its public policy making.

At present, it is the professional opinion of R. C. Wood & Associates that the current level of validity found in the evidence based model leaves much to be desired and is not reflective of the best approach for a variety of research constraints. Thus, it is the professional opinion of R. C. Wood & Associates that the evidence-based model will be less fruitful in its application for the state of Rhode Island.

The last model that would be recommended as a sole approach would be the professional judgment model. It is the professional opinion of R. C. Wood & Associates that at the present time professional judgment models are the least valid and the least replicable, and thus open to a host of criticisms, concerns, and reflect the lack of empirical rigor of either the successful schools or the cost function model.

Thus, for the state of Rhode Island, given the present status and validity of education finance research it is recommended that the successful schools model and/or the cost function approach would be the most fruitful for the state of Rhode Island. If either of these two models were to be constructed carefully, the state of Rhode Island could produce a targeted expenditure that should be sound and reflect the present state of knowledge in funding public elementary and secondary education.

Of these two models, the successful schools model and the cost function program, if one model were chosen, the successful schools model, if carefully designed and crafted, would have the greatest probability of yielding the most useful model. This usefulness is reflected in that this model is the most closely understood by the public thus reflective of public policy determinations. Again, it must be clearly understood that all the models provide useful information. It also must be clearly understood that certain models are more useful than others. Overall, the legislature could choose any of the models and justify its actions. However, in terms of the validity and usefulness of the models the highest-ranking model to the lowest ranking model at the present time reflects the following rank order:

- Successful Schools Model
- Cost Function Program Model
- Evidenced-Based Model
- Professional Judgment Model

Notwithstanding this ranking, it is the purview of the Legislature to choose the model, combination of models, or ranges they it accepts as having the greatest validity. From the range of models and expenditure patterns a strong, viable, and valid education finance distribution formula could be crafted.

It is important to note that this assessment and report is engaged in an examination of information as to how the state legislature can establish an amount to assure an adequate education for the school children in the state of Rhode Island. The conceptualization of the education finance distribution formula is presented as an overall child-need based formula in order for the legislature to address how the state legislature might wish to distribute state and local moneys for the elementary and secondary education in the state. The actual examination and design of a state aid distributional system was not part of this study as it was outside the confines of this report. This report only addresses the targeted amount that should address the issues of offering an adequate education within the state of Rhode Island.

The Legislature may embrace any one of the methodologies or any combination of the methodologies. At this time, it is the professional opinion of R. C. Wood & Associates that the Legislature would be well advised to examine how successful schools, as defined in the state of Rhode Island could be utilized in meeting the targeted expenditures. If the successful schools model were to take into account the various achievement standards, as well as those districts making progress toward achievement levels, and a host of other important and significant variables such as student demographics and differing educational needs that could be utilized within this model it could generate the expenditure targets that could prove to be quite useful to the state of Rhode Island. With great care, the creation of a new and viable education finance distribution formula could be coupled to performance school districts. The performance school districts could be identified with legitimate adjustments. This model would be similar to the issues as identified in the cost function model and would reflect the aspirational fiscal goals that the state legislature should transcend toward over a reasonable period of time.

The alternative is to create the target expenditure via a cost function model while accounting for a host of variables. The variables, as identified by R. C. Wood & Associates would include items that reflect students in poverty, English language learners, special education programs, cost of education adjustments, scale and sparsity adjustments. Either model could serve the legislature if designed properly.